Industrial Standardization

October
1943

Standards in
Shipbuilding
(Page 278)

American Standards Association

Officers

R. E. Zimmerman, President — George S. Case, Vice-President

P. G. Agnew, Secretary — Cyril Ainsworth, Assistant Secretary

Board of Directors

R. P. Anderson, secretary, Division of Refining, American Petroleum Institute, New York—Past-Chairman, ASA Standards Council

J. T. Barron, vice-president, Public Service Electric and Gas Company, Newark, New Jersey—American Institute of Electrical Engineers

S. Bruce Black, president, Liberty Mutual Insurance Company, Boston, Mass.—National Association of Mutual Casualty Companies

Carl Breer, executive engineer, Chrysler Corporation, Detroit, Michigan—Automobile Manufacturers Association

Lyman J. Briggs, director, National Bureau of Standards, Washington, D. C.—U. S. Department of Commerce

Henry B. Bryans, executive vice-president, Philadelphia Electric Company, Philadelphia, Pa.—Electric Light and Power Group

G. S. Case, chairman of Board, Lamson and Sessions Company, Cleveland, Ohio—Vice-President

A. K. Chapman, vice-president and assistant general manager, Eastman Kodak Company, Rochester, N. Y.—Photographic Manufacturers Group

C. L. Collens, president, Reliance Electric & Engineering Company, Cleveland, Ohio—National Electrical Manufacturers Association

Howard Coonley, chairman of Board, Walworth Company, New York—Manufacturers Standardization Society of the Valve & Fittings Industry

C. A. Gill, vice-president, Reading Company-Central Railroad Co. of N. J., Philadelphia, Pa.—Association of American Railroads

Robert G. Griswold, president, Electric Advisers, Inc., New York—American Gas Association

H. S. Osborne, chief engineer, American Telephone & Telegraph Company, New York—Chairman, ASA Standards Council

Edmund A. Prentis, Spencer, White & Prentis, Inc., New York—Past-President, American Standards Association

Alvah Small, president, Underwriters' Laboratories, Inc., Chicago, Ill.—Fire Protection Group

John Stilwell, vice-president, Consolidated Edison Company of N. Y., New York—National Safety Council

Jerome Strauss, vice-president, Vanadium Corporation of America, New York—American Society for Testing Materials

Robert E. Wilson, president, Pan American Petroleum & Transport Company, New York—American Petroleum Institute

R. E. Zimmerman, vice-president, U. S. Steel Corporation, New York—President

Standards Council

H. S. Osborne, chief engineer, American Telephone & Telegraph Company, New York, Chairman

E. C. Crittenden, assistant director, National Bureau of Standards, Vice-Chairman

Chairmen of Correlating Committees

Building—Rudolph P. Miller, Consulting Engineer, New York

Consumer—Irwin D. Wolf, vice-president, Kaufmann Department Stores, Inc., Pittsburgh, Pa.

Electrical—C. R. Harte, Connecticut Company, New Haven, Conn.

Highway Traffic—Hawley S. Simpson, Research Engineer, American Transit Association, New York

Mechanical—Alfred Iddles, Babcock & Wilcox Co., New York

Mining—Dan Harrington, chief, Health & Safety Branch, U. S. Bureau of Mines, Washington, D. C.

Safety—W. R. Smith, Safety Engineer, Public Service Electric & Gas Company, Newark, N. J.

ASA Member-Bodies

Am. Gas Assn
Am. Institute of Bolt, Nut & Rivet Mfrs
Am. Institute of Elec Engineers
Am. Institute of Steel Construction
Am. Iron & Steel Institute
Am. Petroleum Institute
Am. Soc of Civil Engineers
Am. Soc of Mechanical Engineers
Am. Soc for Testing Materials
Am. Soc of Tool Engineers
Am. Transit Assn
Am. Water Works Assn
Assn of American Railroads
Automobile Mfrs Assn
Cast Iron Pipe Research Assn
Copper & Brass Research Assn
Electric Light and Power Group:
  Assn of Edison Illuminating Companies
  Edison Electric Institute
Federal Works Agency
Fire Protection Group:
  Associated Factory Mutual Fire Insurance Companies
  Nat Bd of Fire Underwriters
  Nat Fire Protection Assn
  Underwriters' Laboratories, Inc
Institute of Radio Engineers
Lumber Mfrs Group:
  Timber Engg Co (subsidiary of Nat Lumber Mfrs Assn)
  Mfrs Standardization Soc of the Valve and Fittings Industry
Metal Cutting Tool Institute
Nat Assn of Mutual Casualty Companies
Nat Conservation Bureau
Nat Electrical Mfrs Assn
Nat Housing Agency
Nat Machine Tool Builders' Assn
Nat Safety Council
Outdoor Advertising Assn of America, Inc
Photographic Mfrs Group:
  Agfa Ansco Division of General Aniline & Film Corporation
  Eastman Kodak Company
Soc of Automotive Engineers
Telephone Group:
  Bell Telephone System
U.S. Department of Agriculture
U.S. Department of Commerce
U.S. Department of the Interior
U.S. Department of Labor
U.S. Govt Printing Office
U.S. Navy Department
U.S. Treasury Department
U.S. War Department

Associate Members

Am. Assn of Textile Chemists and Colorists
Am. Council of Commercial Laboratories
Am. Gear Mfrs Assn
Am. Home Economics Assn
Am. Hospital Assn
Am. Institute of Architects
Am. Soc of Heating & Ventilating Engineers
Am. Soc of Refrigerating Engineers
Am. Trucking Assns, Inc
Am. Welding Society
Anti-Friction Bearing Mfrs Assn, Inc
Associated General Contractors of America
Assn of Gas Appliance and Equipment Mfrs
Assn of Iron and Steel Engineers
Comm on Consumer Relations in Advertising, Inc
Grinding Wheel Mfrs Assn
Gypsum Assn
Heat Exchange Institute
Illuminating Engineering Society
Industrial Safety Equipment Assn
Internat Acetylene Assn
Modular Service Assn
Nat Elevator Manufacturing Industry, Inc
Nat Lime Assn
Nat Retail Dry Goods Assn
Radio Mfrs Assn
Soc of Motion Picture Engineers
Structural Clay Products Institute
Textile Color Card Assn of the U.S., Inc
U.S. Cap Screw Service Bureau
U.S. Machine Screw Service Bureau

Company Members—Some 2,000 industrial concerns hold membership either directly or by group arrangement through their respective trade associations.

Industrial
Standardization

Published Monthly by

American Standards Association

29 West 39th Street, New York 18, N. Y.

RUTH E. MASON, Editor

Our Front Cover: A Liberty ship prior to her launching at a West Coast shipyard. U. S. Maritime Commission photo.

This Issue

Photography—

New Standard Defines ASA Speed for Photography. By M. E. Russell 269

ASA Authorizes War Project on Photography 272

Military Radio—

Second War Standard in Series Covers Steatite Radio Insulators. By H. R. Wilsey 273

Shipbuilding—

Standard Models Speed Shipbuilding. By H. Gerrish Smith 278

Safety—

New WPB Order Requires American Safety Shoe Standards 275

Safety Standards Help in Fight on Home Front Accidents 276

American Safety Standards Approved This Year 277

Smith and Craugh Head Safety Code Correlating Committee 284

ASA Asks for Comments on Proposed Work Clothes Standards 285

Industrial—

Propose New Standard Keyboard for Speedier Typing 272

Coonley Describes Conservation Methods at Canadian Meeting 281

ASTM Acts On New Standards 287

Industrial—(Continued)

Commercial Standard for Tire Retreading .. 290

Standards Issued by Associations and Government 291

Consumer—

ASA Consumer Goods Committee Outlines Future Program 272

Shoe Association Asks for Standards for Synthetic Soles 275

ASA Asks for Comments on Proposed Work Clothes Standards 285

Foreign—

New Foreign Standards Now in ASA Library 290

British Institution Reports Increased Use of Standards 292

ASA—

Dan F. Hayes Is New ASA Staff Member .. 283

ASA Standards Activities 294

American Standards 294

American War Standards 294

News About ASA Projects 295

General—

Revise Standard Color Card for Army's Thread 283

Carl Edvard Johansson 293

Warren Emley Retires 295

Bureau Broadcasts Frequencies from New Radio Station 295

ASA

Reg. in U.S. Pat. Off.

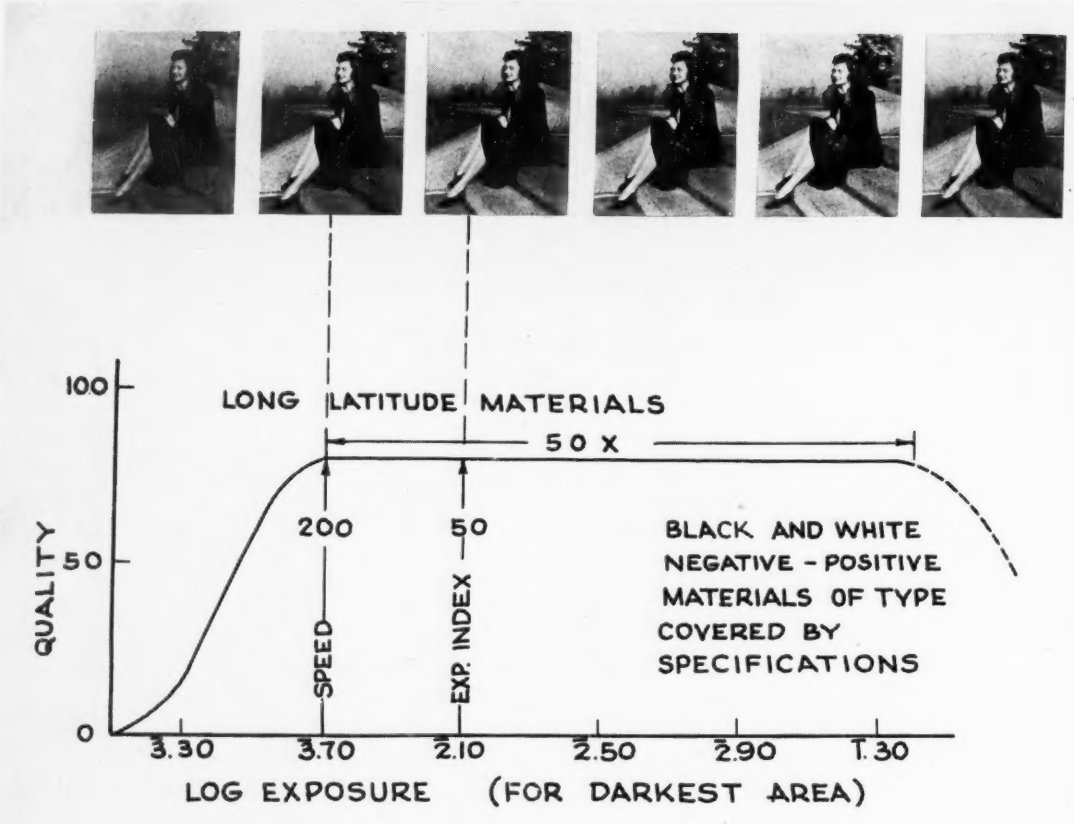
Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Subscription price $4.00 per year (foreign $5.00); Special to schools and libraries $2.00 (foreign $3.00); single copies 35 cents

October, 1943

Vol. 14, No. 10

Re-entered as Second Class Matter July 31, 1943, at the Post Office at New York, N. Y., under the Act of March 3, 1879.



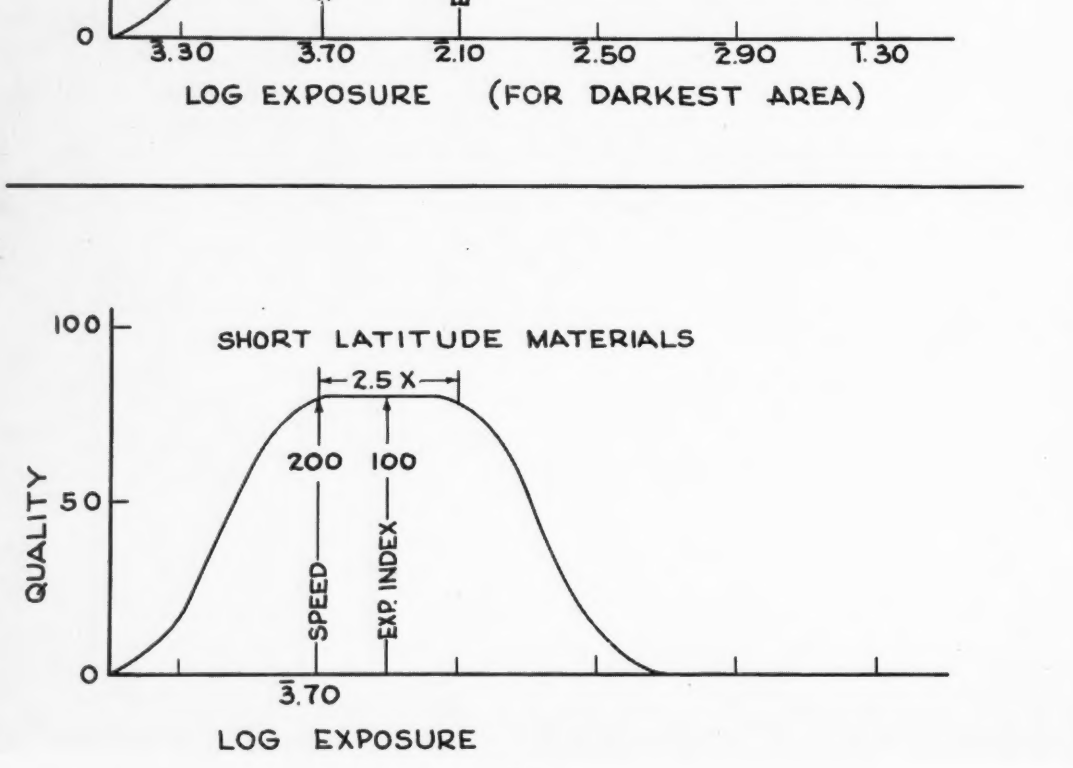


FIG. 1

The negatives which made the prints above were given a range of exposure from underexposure to overexposure. These prints and the top chart show how the quality of the print increases with increase in exposure and then remains practically constant even though the exposure increased 50 times. In this chart the actual speed of the film is shown as 200—a log exposure of $\bar{3}.70$. The actual exposure time recommended for this film (the Exposure Index) is increased, however, to $\bar{2}.10$ to allow for uncertainties in processing, lighting, camera operation, etc. This applies to black and white negative-positive materials (long latitude materials) covered by the present standard. The curves above show, however, that the ratio between Speed and Speed Number may vary from one class of materials to another.

New Standard Defines ASA Speed for Photography

by M. E. Russell[1]

Chairman, Subcommittee 2 on Sensitivity to Radiant Energy, Sectional Committee on Photography

A NEW American Standard which should be of use to many workers in the field of photography has just been completed by the ASA Committee on Standardization in Photography (Z38) and approved by the American Standards Association. It is a method for determining photographic speed and speed number for roll films, film packs, and miniature camera films. It applies to individual samples and also to a product as a whole, and is based on a proposed method which was published for trial and criticism in January 1941.[2]

From film tested according to the procedure outlined in this standard, two values are calculated. One is known as "ASA Speed" and the other is called "Speed Number." Each is intended for a different purpose:

ASA Speed is a value indicating the *minimum* camera exposure which the film must receive in order to produce a negative from which an excellent print may be obtained.

Speed Number (or Exposure Index) is a practical adaptation of the ASA Speed, and refers to the *recommended* exposure for normal photographic practice, to yield the highest percentage of excellent pictures.

The relationship of these two quantities to each other is indicated in Figure 1. At the top of the figure is a series of prints made from negatives which were given a range of exposures from underexposure to overexposure. It will be noticed that as the negative exposure increases, the print quality increases rapidly to a high value and then remains substantially constant for further increases in negative exposure. This is illustrated graphically in the upper curve of the figure. The first or lowest log exposure value which will result in a negative capable of producing an excellent print is $\overline{3}.70$. According to the American Standard method (Fig. 2) the Speed for this material is:

$$\text{Speed} = \frac{1}{E} = 200$$

To avoid confusion with other systems, this value is written ASA 0200.

It is not usually desirable, however, to take pictures on the basis of the least exposure required. It will be noted from the curve that the exposure could be increased as much as 50 times and still give negatives from which excellent prints could be made. In normal photographic work it is customary to recommend an exposure somewhat greater than the minimum, to allow for uncertainties in processing, lighting conditions, camera operation, etc. Exposure tables, computers, and exposure meters are normally designed to take into consideration this additional exposure. Experience has shown that when the ASA Speed is divided by 4 the resulting numbers correspond to those now commonly used in several popular exposure meters and exposure computers. The numbers so derived are called Speed Numbers (Exposure Indexes).

The new photographic standard which is explained in the following article deals with one of the most basic problems in photography—the control of the exposure time for film. This standard, and similar standards for other classes of film which are to follow, will provide American film manufacturers with a common language for telling photographic users how to expose their films properly.—EDITOR.

[1] Eastman Kodak Company, Rochester, N. Y.

[2] *Journal of the Optical Society of America*, **31**, 87-92 (1941); *Industrial Standardization*, **11**, 277-281 (1940).

ASA Committee Developed Speed Standard

The ASA Committee on Standardization in the Field of Photography was appointed in September 1938, on the recommendation of a general conference of the American photographic industry. This action followed a request from the International Standards Association that the ASA accept the secretariat for ISA Committee 42 on Photography.

The Optical Society of America has the administrative leadership for the work of the ASA committee, with Loyd A. Jones as chairman, and J. W. McNair of the American Standards Association as secretary.

Comments on the work of the committee are always welcomed and should be sent to the American Standards Association, 29 West 39th Street, New York 18, N. Y.

Subcommittee No. 2 on Sensitivity to Radiant Energy, which developed the standard on Photographic Speed and Speed Number, has the following membership:

M. E. Russell, Eastman Kodak Company, *Chairman*
Paul Arnold, Agfa Ansco Division of General Aniline and Film Corporation
Joseph M. Bing, Photo Utilities, Inc.
Walter Clark, American Committee of the International Congress of Photography, and Eastman Kodak Company
Raymond Davis, National Bureau of Standards, U. S. Department of Commerce.
John Dessauer, The Haloid Company
W. N. Goodwin, Jr., National Electrical Manufacturers Association
F. K. McCune, National Electrical Manufacturers Association
Brian O'Brien, Optical Society of America
Rowland S. Potter, Defender Photo Supply Company, Inc.
E. D. Tillyer, American Optical Company
D. R. White, duPont Film Manufacturing Corporation

The ratio of the numerical values of Speed and Speed Number will not always be 4 (this fact is indicated by the second curve in Figure 1), since other classes of photographic materials may not possess the long exposure latitude of the class of films covered by the present specification. In the future work of the committee, some classes of material (specifically for reversal and color) will be found with exposure latitude so short that the recommended exposure (Speed Number or Exposure Index) will need to be much nearer the minimum. Thus it is quite conceivable that in the field of photography there may be two materials having the same Speed but quite different Speed Numbers.

In March 1942, at the request of the armed forces of the United States, the American Emergency Standard Photographic Exposure Computer was issued. In this standard it was necessary to provide a value which, when used in connection with the exposure calculator included in the standard, would insure obtaining suitable negatives. In the Emergency Standard this value was called Film Exposure Index. When the committee subsequently came to consider a name for this quantity to use in the present standard, it was concluded that for general civilian use it would be more satisfactory to employ a name indicating that the value was related to Speed. The term Speed Number was therefore chosen. The concept of Speed Number in the present specification is the same as that of Film Exposure Index in the Emergency Standard. Since the Emergency Standard has received wide circulation among the armed forces of the United States and has had some distribution among civilians, the term Exposure Index is well known to many people. For that reason, wherever the term Speed Number is used in this article, Exposure Index is also used, in parentheses, to indicate that the two names represent one and the same quantity.

Defines Sensitivity Characteristics

The new standard fills a long-felt need in the American photographic industry for a well-defined method of expressing the sensitivity characteristics of photographic materials, a system which should be endorsed by the whole industry. During the last ten or fifteen years the number of films available to the photographer for various types of photographic work has become so great that the average photographer is at a loss to know the relative speeds of all these materials and how to expose them correctly. He has received data from the film manufacturers, from the manufacturers of exposure meters and exposure calculators, and from the photographic journals. Since no common system of evaluation has been used by all sources of data, the photographer has had thrust upon him a large group of numbers which were often more confusing than helpful.

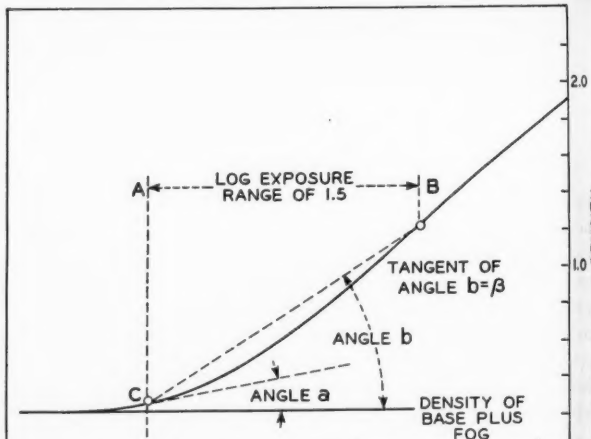


FIG. 2

The method of computing the sensitometric criterion of speed consists of plotting the density-log exposure curve of a photographic material for a given set of conditions (exposure, development, etc.). A log exposure range of 1.50, represented in the figure by the distance AB, is then moved along the horizontal axis from left to right until the slope (or gradient) of the curve at the low end of the range is 0.30 of the average slope over the entire range. When the slope or tangent of angle *a* is 0.30 of β (*i.e.*, the tangent of angle *b*), the point C, at the low end of the log exposure range, represents the exposure value (*E*) from which the Speed of the material is derived.

A simple rule for exposing an average scene like this in full sunlight:—

At f/11 the exposure time is $\frac{1}{\text{Exposure Index}}$

The situation was sure to become worse as more exposure calculators were introduced on the market and more manufacturers had film products to evaluate. A glimpse of what might have occurred, were it not for the advent of an American Standard, can be obtained by noting that in Europe, where no one system has gained general favor, one photographic manufacturer before the war found it necessary to express the characteristics of his materials on more than twenty different scales, to take care of the numerous exposure computing devices then current.

The new American Standard should prevent such a situation from arising in this country. According to the standard, a film requires but two numbers: an ASA Speed to indicate the inherent speed of the film, and a Speed Number (Exposure Index) to indicate how it should be exposed.

A very useful property of the ASA Speed is that it provides a reliable basis or starting point for computing the Speed Number (Exposure Index). ASA Speed will also be useful to laboratory workers who wish to study the properties of the film itself. The standard provides a good tool for such a worker, as all steps of the testing technique are specified in detail in terms of physical and chemical units. Since ASA Speed is expressed on an absolute rather than on a relative basis, those workers who know the exact value of illumination incident upon the surface of their photographic material can readily use the ASA Speed in calculating camera exposure.

To the majority of American photographers the Speed Number (Exposure Index) will be of more interest than the ASA Speed. Two of the common exposure meters on the American market, the Weston and the General Electric, have been so constructed by their manufacturers that they use very nearly the same number to express the film characteristics to obtain the same average density in negatives. The American Standard Speed Number (Exposure Index) scale has been so chosen that it agrees closely with the scale used by both these meter manufacturers. Consequently, for all practical purposes in the amateur materials covered by the present specification, Speed Numbers (Exposure Indexes) may be used directly on either the Weston or the G-E meter. The Emergency Standard Computer previously referred to also uses the Speed Number scale. It is to be hoped that the new standard, developed by a committee representing a cross-section of American photographers, will be so generally accepted by all branches of the industry that as new films

ASA Authorizes War Project on Photography

As this issue of INDUSTRIAL STANDARDIZATION goes to press the Chairman of the Standards Council has approved the setting up of a War Committee on Photography following a request from the War Production Board on behalf of the armed services received by the ASA on October 14th. Purpose of this new war project is to provide specifications for the various types of photographic and cinematographic equipment to be used by the armed forces.

Work will be carried out under the contract existing between the American Standards Association and the War Production Board.

are developed they will be rated by this system, and as new exposing mechanisms appear on the market they will incorporate the Speed Number (Exposure Index) scale of this standard.

Speed Numbers (Exposure Indexes) may be very conveniently used in a rule-of-thumb method for making outdoor exposures: For normal snapshot scenes, that is, for average subjects illuminated by direct sunlight, the proper exposing time is always 1 divided by the Speed Number (Exposure Index), when the lens aperture is set at f/11. For example, a film having a Speed Number (Exposure Index) value of 50 requires 1/50 second at f/11 to take pictures of average subjects in direct sunlight. A material having a Speed Number (Exposure Index) of 100 requires 1/100 second under the same conditions.

While the present standard may well be considered a major advance in unifying the method of expressing sensitivity characteristics of photographic materials, the work of the committee is far from complete. The basic concepts of this specification are applicable to all photographic materials, but the present standard describes detailed methods for determining values only for the commonly used amateur materials. It is planned that, as fast as possible, standards will be drawn up to cover other classes of film.

ASA Consumer Goods Committee Outlines Future Program

THE Advisory Committee on Ultimate Consumer Goods of the American Standards Association has voted to enlarge its membership to include representatives of national manufacturing groups and service organizations as well as to broaden the consumer and distributor representation that has thus far made up the principal membership of this committee. Among the new groups to be invited to join will be manufacturers, trade associations, several additional consumer and retailing groups, and labor organizations. The committee made its decision at a meeting held September 27.

Three basic jobs must be finished as rapidly as possible before a large number of needed standards in the field of consumer goods can be undertaken, the committee agreed. These jobs are:

Textile Test Methods. This means agreement among laboratories on acceptable procedures for testing textiles, and looking toward uniformity in interpretation of test data.

Definitions for Consumer Goods. This job was started a number of years ago to develop a "dictionary" of widely used but variously understood terms in the consumer-retailer-advertising field.

Standards for Children's and Women's Garment Sizes. A standard for boys' body sizes has already been completed, but completion of the others is fundamental to the development of a common denominator in size classifications.

The committee discussed the need of beginning now to plan for the post-war period, recognizing, however, that the introduction of many new materials and methods during the war era will have an important influence on such a program. It was recommended that a planning committee be appointed to:

(1) Investigate the commodity field as it is affected by new materials, making recommendations to the ACUCG as the need arises for standards for specific commodities made of new materials such as plywood, plastics, synthetic rubber, etc.

(2) Review standards set by the war agencies, especially WPB and OPA, which may lend themselves to the development of American Standards in the important field of consumer goods.

(3) Review American War Standards for consumer goods, making recommendations as to whether they should be adopted as peacetime standards, or should be withdrawn.

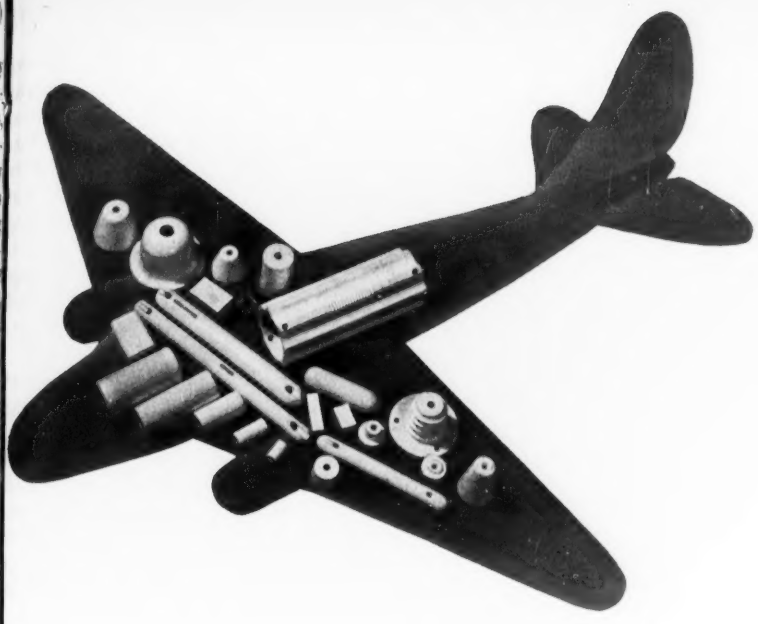
Before adjourning, the committee directed its chairman to appoint a small executive committee from among its membership. The duty of this executive committee will be to act as an interim committee in direct supervision of projects; in expediting the development and completion of standards; and in maintaining continuing liaison with all subcommittees operating under ACUCG.

Irwin D. Wolf, vice-president, Kaufmann Department Stores, presided over the meeting. Morris L. Chandross, commodities engineer of the ASA staff, was appointed secretary of the committee.

Propose New Standard Keyboard For Speedier Typing

One of the most widely used and widely known standard pieces of office equipment stands a chance of revision due to technological progress. This is the standard keyboard on office typewriters.

A new keyboard designed for greater speed and easier operation by Lieutenant Commander August Dvorak, the Navy Department's top time and motion study expert, divides the labor of typing between the two hands, 44 percent for the left hand and 56 percent for the right. On the present standard keyboard it is about 57 and 43 percent, respectively. The result of the change, the Navy Department announces, makes it possible to increase output by about 35 percent.



Approval by the American Standards Association of the American War Standard, Steatite Radio Insulators (C75.2-1943), makes available for the use of industry and the Armed Forces the second standard in a series of performance requirements for ceramic radio insulators.

Second War Standard in Series Covers Steatite Radio Insulators

by H. R. Wilsey

Radio Engineer, American Standards Association

WITH the outbreak of war, industry was presented with the problem of equipping a large, newly trained Army and Navy with the most efficient and most modern means of communication obtainable. For a few manufacturers this meant merely gearing up their factories for mass production of their standard products, but for a vast majority of manufacturers it meant the redesign of equipment, and retooling for the mass production of new and perhaps relatively unfamiliar products. In either case, it was necessary that the equipment produced be of adequate construction to comply with rigid Army or Navy specifications.

The components to be used in the assembly of radio receivers and transmitters must be individually satisfactory for the particular receiver or transmitter in which they are to be assembled. Capacitors, resistors, insulators, vacuum tubes, or the like, must be of such accurate design and manufacture that they can function satisfactorily under the extreme service conditions of military operations in the air, at sea, or on the desert. Likewise, the design of each component should be such as to permit ready replacement in the field of components which have failed, or which have been damaged in service.

Of the many components comprising a piece of modern radio equipment, insulators are one of the most important. They provide rigidity in the mounting of other components, and they separate different electrical circuits. Frequently, however, in the basic theoretical design of radio apparatus consideration is not given to insulators because the electrical properties can be calculated only approximately. Practical design dictates certain minimum electrical and mechanical properties which must obtain in an insulator for each application. Failure of an insulator to meet these minimum requirements might mean the loss of that extra power needed by some advance field unit trying to contact its command post.

Steatite is a ceramic material long used for electrical insulation, particularly in radio applications. Low power factor and low dielectric loss factor make steatite insulators important in the design of present-day radio equipment. The advantageous properties of steatite are obtained by the firing at high temperatures of mixtures of raw materials in the proper proportions. Such a mixture consists principally of powdered talc (magnesium silicate), or soapstone, and a flux, with perhaps the addition of water to render the mass more pliable. In some cases clay is added to this mixture. Insulators

Task Group on Steatite Insulators

The following are the members of Task Group 2 who participated in the development of the American War Standard for Steatite Radio Insulators (C75.2-1943):

E. A. Domber, Isolantite, Incorporated, Belleville, N. J.
B. R. Boymel, Navy Department, Bureau of Ships, Washington, D. C.
K. H. Brandt, Signal Corps Ground Signal Agency, Red Bank, N. J.
T. M. Caven, Signal Corps Ground Signal Agency, Belmar, N. J.
C. H. Crawford, General Electric Company, Schenectady, N. Y.
Sam DiVita, Signal Corps Ground Signal Agency, Red Bank, N. J.
R. W. Ferguson, Star Porcelain Company, Trenton, N. J.
F. E. Hansen, Western Electric Company, Kearny, N. J.
V. E. Heaton, National Bureau of Standards, Washington, D. C.
J. H. Koenig, Lt. (j.g.) USNR, Army-Navy Electronics Production Agency, Washington, D. C.
D. G. Little, Westinghouse Electric & Manufacturing Company, Baltimore, Md.
R. L. McCoy, Locke Insulator Corporation, Baltimore, Md.
Harold Miller, Aircraft Radio Laboratory, Dayton, Ohio.
J. R. O'Brien, W. O., USNR, Navy Department, Bureau of Ships, Washington, D. C.
W. H. Siesel, Lenox, Incorporated, Trenton, N. J.
C. L. Snyder, General Ceramics and Steatite Corporation, Keasbey, N. J.
N. H. Snyder, National Ceramic Company, Trenton, N. J.
R. E. Stark, Stupakoff Ceramic and Manufacturing Company, Latrobe, Pa.
Frank J. Stevens, American Lava Corporation, Chattanooga, Tenn.
H. R. Terhune, Radio Corporation of America, Camden, N. J.

Copies of this standard may be obtained from the American Standards Association for 50 cents each.

may be formed from this mixture by molds and dies or by extrusion and are usually machined before firing. The firing treatment causes the formation of a crystalline structure, homogeneous in texture, and having fairly well defined electrical properties, depending upon the chemical composition of the raw materials.

Some of the difficulties encountered in the manufacture and utilization of insulators are attributable to non-uniformity of the manufacturing practices of insulator manufacturers and also to variations in requirements for identical articles procured by different purchasers. The problem of the supply and repair depot must likewise be considered. Wide variations in overall dimensions, or differences in hole diameters or in the screw threads used would obviously present a gigantic stock problem at a supply depot.

At the request of the War Production Board a plan has been devised to overcome many of these production troubles caused by non-uniformity of manufacturing practices and of methods of procurement. A program[1] has been established whereby representatives of the Armed Forces and of industry meet to discuss their mutual problems around a conference table, and to prepare mutually acceptable standards which will solve many of their problems and misunderstandings. Under this program the War Committee on Radio, with several subcommittees, has been established with the staff of the American Standards Association as secretariat.

Subcommittee 1 of the War Committee on Radio deals with insulating materials. One of the task groups of Subcommittee 1 prepared the American War Standard, Ceramic Radio Insulating Materials, Class 1 (C75.1-1943).[2] This standard has been adopted by industry and the Armed Forces for the qualification approval, or acceptance testing, of the basic materials employed in all types of ceramic insulators (*i. e.*, glass, glass-bonded mica,[3] porcelain, and steatite). Another task group of Subcommittee 1 prepared the American War Standard, Steatite Radio Insulators (C75.2-1943), which has just been adopted for purposes of procurement by branches of the Armed Forces.

Laboratory Tests Simulate Service Conditions

The uncompromising test to which equipment is subjected in the Aleutians, in Guadalcanal, or on the deserts of North Africa, must not, in itself, be relied upon to furnish qualification approval. The acceptability of the insulator must be determined in the laboratory under carefully simulated conditions of service. The basic qualification tests are performed under C75.1 with the addition of design requirements for specific styles of steatite insulators in C75.2.

The program of the steatite task group was initiated during a period when the acute shortage of steatite was a serious threat to the continued production of radio equipment. This shortage had developed for several reasons: the rapid increase in equipment production soon absorbed existing stocks of insulators and overloaded existing production facilities; dies and molds, furnaces and machining equipment required for the expansion of the steatite insulator industry were not common to this industry alone, so each had to await his turn; new mines of the raw materials had to be located, assays had to be made, and further research was necessary before the new materials could be used in production.

Careful Study Led to Standard

In the meantime, this task group spent many hours in conference and in the collection and analyzing of data towards the preparation of a standard. Existing specifications of NEMA, RMA, and the Armed Forces and the published recommended practices of several of the leading manufacturers in the industry were reviewed. Specific insulators which had been standardized previously by each of these organizations were considered by members of the task group and, where found to be in sufficient demand for use in military radio equipment, were included in the standard. Additional types of insulators not previously standardized were included if their widespread usage indicated the desirability of their inclusion.

[1] See "War Standards for Military Radio" by S. K. Wolf, INDUSTRIAL STANDARDIZATION, September, 1942, page 81, and "Standardization of Radio Parts Aids Production" by S. K. Wolf, INDUSTRIAL STANDARDIZATION, May, 1943, page 149.

[2] See "War Standards for Ceramic Materials for Radio Insulators" by Alfred N. Goldsmith, INDUSTRIAL STANDARDIZATION, March 1943, page 81.

[3] American War Standard on Glass-Bonded Mica Radio Insulators (C75.6-1943).

This program was started before the organization of the Signal Corps Standards Agency, or SCSA. The SCSA now plays an obviously important part in the preparation of standards such as C75.2, inasmuch as it is an agency through which coordination may be obtained of the requirements of various branches of the Army and Navy. It is in a position to present the unified opinion of the Armed Forces and is set up to handle qualification, or type, approval of radio components.

Will Benefit Armed Forces and Industry

It is anticipated that the publication of this standard will be of considerable benefit to the Armed Forces and to industry. The standard as a whole represents a specification suitable for the procurement of insulators by either radio prime contractors or by any individual branch of the Armed Forces. Sections C, D, E, and F include standard practices, requirements, manufacturing tolerances, and inspection procedures for the use of inspectors of both industry and the Armed Forces in determining the suitability of insulators. The standard drawings covering specific insulators will be helpful in decreasing the number of stock items for the insulator manufacturer, the equipment manufacturer, and for the military supply and repair depots. The standard drawings will also show the equipment design engineer exactly what styles and sizes of insulators are available. Specific details of steatite insulators which have been standardized include: outline dimensions such as length and diameter or cross section, hole diameter, hole tap (size, pitch, and depth). The type designation is readily adaptable to the standard insulators. This means that the insulator manufacturer will apply one type designation to an insulator whether it is to be used by the Army, the Navy, or for civilian replacement.

A useful and novel appendix has been included in this standard in which are given design criteria as recommended by various insulator manufacturers and as found to be satisfactory by the other steatite manufacturers represented on the task group. It is expected that this section will be particularly well adapted in assisting new personnel in radio design departments in that it explains what can be done with this particular form of insulation and gives the reasons for the specific requirements of the standard.

Official Signal Corps Photo

Dependable radio parts keep field units in contact with each other at all times.

The task group was organized and directed as a part of Subcommittee 1 on Insulating Material Specifications for the Military Services, with Dr. Alfred N. Goldsmith as chairman, and functioned under the chairmanship of E. A. Domber, Isolantite, Inc. Each succeeding draft of the standard as prepared by the task group was subject to review and criticism by members of Subcommittee 1 and by members of the ASA War Committee on Radio, which is under the chairmanship of S. W. Wolf. Mr. Wolf is Assistant Director for Production, Radio and Radar Division of the War Production Board. One of the intermediate drafts and the final approved standard received a wide distribution to all types of radio equipment manufacturers and other users of ceramic insulators.

Standard Samples Help War Industries

Sale of its standard samples has reached a new high, with 2,303 samples sold in April, the National Bureau of Standards announces. These samples find a wide use in connection with the war effort for checking methods used in testing raw materials, controlling manufacturing processes, and inspecting finished products. They include ores, irons, steels, steel-making alloys, non-ferrous metals, ceramic materials, and pure chemicals which are certified as to composition. They also include metals of certified melting points; thermoelectric standards for calibrating thermocouples; chemicals for checking heating values; cements for checking the fineness of sieves; and sugars of saccarimetric values.

A description of the standard samples and their price is available from the National Bureau of Standards.

New WPB Order Requires American Safety Shoe Standards

On October 18, the War Production Board issued order M-217 limiting manufacture of safety shoes to those that meet the requirements of the American Standards, stating specifically that "no person shall manufacture any safety shoes . . . except those which comply in respect to types, patterns, materials, methods of construction, labelling and all other details with the American War Standard Specifications for Occupational Footwear, published by the American Standards Association."

Safety Standards Help In Fight on Home Front Accidents

ASA Safety Code Correlating Committee Reports on Codes Under Development

LAST year more Americans were lost to the war effort through accidents on the home front than were killed, wounded, or captured in military and naval operations, the National Safety Council points out in a recent report. Since December 7, 1941, casualties in the United States armed forces totalled 20,000 dead, 28,000 wounded, and 32,000 missing. In the same period casualties to Americans on the home front totaled 80,000 dead, and several million injured. In this appalling record, industrial accidents are bulking larger in proportion to home and traffic accidents, due to fatigue caused by long hours, and the use of inexperienced and in some cases less efficient workers.

One of the more effective methods used to fight the menace of industrial accidents is the use of safety standards—standard methods of guarding machinery, standard safe practices in carrying out industrial operations, standard safety garments for workers, standard methods of eliminating dust and gas hazards. Such standards, nationally acceptable to all groups concerned, are being prepared under the supervision of the Safety Code Correlating Committee of the American Standards Association. Many of such national safety standards are already in wide use by industry, state industrial commissions, and insurance companies.

The Safety Code Correlating Committee has now reported on developments in the work on national safety standards during the past year. Standards completed and published since the last annual report include a method of marking compressed gas cylinders to identify contents; a safety code for cranes, derricks, and hoists; a revision of the standard for railroad-highway grade crossing protection; a safety code for the use, care, and protection of abrasive wheels; a safety code for jacks; four standards for the prevention of dust explosions; and three standards which define the allowable concentration in the air of work places of chromic acid and chromates, mercury, and lead. In addition to the regular work, a program of War Standards, carried out under an abbreviated, more speedy procedure, has resulted in approval of two additional standards defining allowable concentrations of metallic arsenic and arsenic trioxide, and of xylene; a standard for protective lighting of industrial properties; and five standards each for men's and women's protective occupational footwear.

Safety in construction is subject of proposed standard.

Progress Reported

In addition to the completed standards, the Safety Code Correlating Committee reported progress on the following:

Standards for Safety in the Construction Industry (A10)—

A new draft of a proposed standard was completed during the past year by the National Safety Council and the American Institute of Architects, sponsors for this project, and the chairman of the sectional committee. The draft is now being sent to letter ballot of the committee. The proposed standard recommends safe practices in construction, demolition, and repair of buildings to protect both employees and the public. One American Standard—Manual of Accident Prevention in Construction (A10.1-1939)—has been in use in this field since 1934.

Recommended Practice for the Inspection of Elevators (Inspectors' Manual) (A17.2-1937)—

A revision has been prepared to bring the Inspectors' Manual into line with the 1942 Supplement of the Safety Code for Elevators, Dumbwaiters, and Escalators (A17.3-1942). A letter ballot on the proposed revision of the Manual probably will be circulated soon.

Safety Code for General Industrial Stairs (A64)—

Work on this project, to recommend safe design and construction of industrial stairs other than those used exclusively for fire exits, has been laid aside for the duration because of vital work in connection with the war.

Safety Code for Power Presses and Foot and Hand Presses (B11-1937)—

The Safety Code Correlating Committee has recommended that the 1937 edition of this standard be revised. It is understood, however, that the sponsor organization, the National Safety Council, is deferring the work of revision until certain new methods in press work are completed.

Safety Code for Conveyors and Conveying Machinery (B20)—

During the past year the ASA staff, in cooperation with C. B. LePage of the American Society of Mechanical Engineers, has reviewed drafts of the several sections of this proposed code as

originally prepared by the subcommittees of Sectional Committee B20. Suggestions for important changes and additions to these drafts have been made. As a result, the sponsors plan to call a meeting of a newly formed editing committee in the early fall to review the text of the draft code in its present form. The code will provide safety rules for the design, installation, operation, and use of all conveyors and conveying machinery.

War Standards for Women's Industrial Clothing (L17)—

At the request of the OPA and WPB, an ASA War Committee has been organized and is developing specifications for the manufacture of women's industrial clothing such as slacks, overalls, coveralls, shirts, aprons, etc. The purpose is to provide necessary protection to the woman war worker as well as to conserve clothing materials and speed up production of work clothes.

Safety Code for Woodworking Plants (O1-1930)—

A revision of the 1930 edition, which has been out of print for some time, has been prepared and is now being sent to letter ballot of the sectional committee.

Ventilation Code (Z5)—

An editorial subcommittee is now preparing a draft standard for control of temperature, humidity, air motion, and odors, based on reports from the technical subcommittees of this sectional committee.

Safety Code for Exhaust Systems (Z9)—

Progress of this committee has been slow due to the pressure of war work. However, a proposed code for exhaust systems to control dust in granite cutting is ready for discussion at the next meeting of the sectional committee. In addition, the American Foundrymen's Association has submitted its standards on metal cleaning sanitation to the ASA, and they have been referred to the subcommittee previously appointed to develop proposed requirements for abrasive cleaning. A report is expected from this subcommittee soon.

Method of Compiling Industrial Injury Rates (Z16.1-1937)—

During the past year a subcommittee has been working on a proposed revision of this standard.

Work in Compressed Air (Z28)—

The proposed standard rules for work under pressure, in tunnels and caissons, which had been stalemated for several years awaiting more information, is now going forward. Data concerning rates of decompression, prepared by the Navy Department, are now being used by the drafting committee in developing a complete draft of a safety code. It is expected that progress on the work will be slow, however, because the drafting committee wants to secure all the technical and medical information which can be obtained through studies of accidents in the construction of the Queens-Midtown Tunnel and the new Manhattan-Brooklyn Tunnel in New York.

Allowable Concentrations of Toxic Dusts and Gases (Z37)—

In addition to the standards completed during the past year on chromic acid and chromates, mercury, metallic arsenic and arsenic trioxides, xylene, and lead, new war standards on methanol, toluene, oxides of nitrogen, and formaldehyde are nearing completion. These standards define the concentration of toxic dusts and gases which may be permitted in the atmosphere of industrial workshops so as to safeguard the health and efficiency of the workers.

Performance Requirements for Protective Occupational Footwear (Z41)—

This project in its peacetime aspects has been tabled for the duration because of the scarcity of preferred materials. American War Standard specifications for protective occupational footwear for both men and women have been completed, however, in order to conserve materials and still provide protection.

Safety Standards Approved This Year

Safety standards under the supervision of the ASA Safety Code Correlating Committee have been completed during the past year as follows:

Safety Code for the Use, Care, and Protection of Abrasive Wheels (B7-1943) 35¢
Safety Code for Cranes, Derricks, and Hoists. (B30.2-1943) $1.50
Railroad-Highway Grade Crossing Protection (D8.1-1943) 10¢
Use of Inert Gas for Fire and Explosion Prevention (Z12.10-1943)
Prevention of Sulphur Dust Explosions and Fires (Z12.12-1943)
Prevention of Dust Ignitions in Country Grain Elevators (Z12.13-1943)
Suggested Good Practices for the Application of Suction and Venting for the Control of Dust in Grain Elevators and Storage Units (Z12.14-1943)
Prevention of Dust Explosions (Z12) Complete series of 14 $1.00
Allowable Concentration of Chromic Acid and Chromates (Z37.7-1943) 20¢
Allowable Concentration of Mercury (Z37.8-1943) 20¢
Allowable Concentration of Lead and Certain of Its Inorganic Compounds (Z37.11-1943) 20¢
Marking Compressed Gas Cylinders to Identify Content (Z48.1-1942) 10¢

American War Standards

Protective Lighting for Industrial Properties (A85-1942) 50¢
Allowable Concentration of Metallic Arsenic and Arsenic Trioxide (Z37.9-1943) 20¢
Allowable Concentration of Xylene (Z37.10-1943) 20¢
Specifications for Protective Occupational Footwear
Men's Safety-Toe Shoes (Z41.1-1943)
Men's Conductive Shoes (Z41.3-1943)
Men's Explosives-Operations (Non-Sparking) Shoes (Z41.4-1943)
Men's Electrical-Hazards Shoes (Z41.5-1943)
Men's Foundry (Molders) Shoes (Z41.6-1943)
Five American War Standards for Men's Safety Shoes published in one pamphlet 40¢
Women's Safety-Toe (Oxford) Shoes (Z41-2-1943)
Women's Safety-Toe (High) Shoes (Z41.7-1943)
Women's Explosives-Operations (Non-Sparking) Shoes (Z41.8-1943)
Women's Conductive Shoes (Z41.9-1943)
Four American War Standards for Women's Safety Shoes published in one pamphlet 40¢

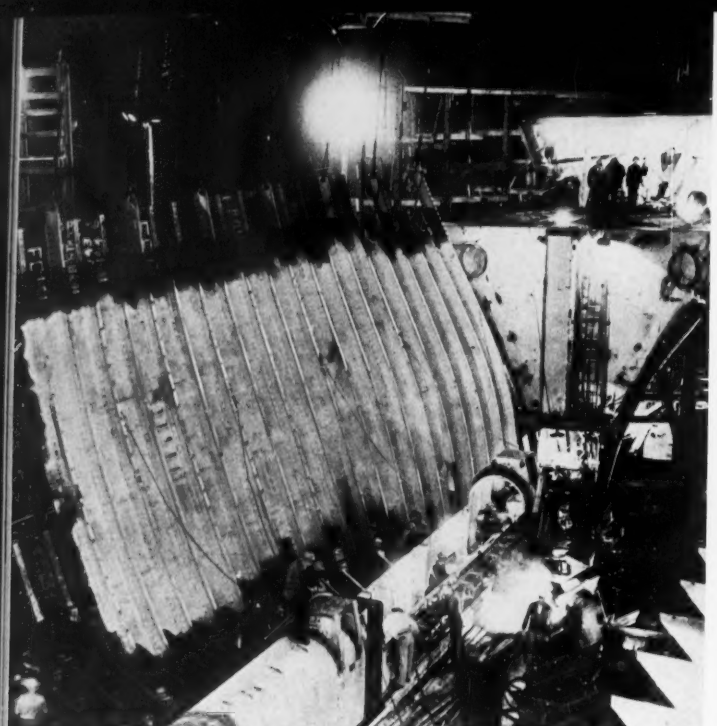
A complete list of approved American Standards, including all approved Safety Standards, can be obtained from the American Standards Association without charge.

Safety Code for Metal-Cleaning Sanitation (Z46)—

The American Foundrymen's Association has submitted its standard on metal-cleaning sanitation to the ASA for approval. This has been referred to the Sectional Committee on Exhaust Systems (Z9) for recommendation.

Protective Occupational (Safety) Clothing (Z51)—

This war project is intended to provide specifications for clothing worn primarily for safety by both men and women in industry. It includes aprons, leggings, coveralls, overalls, gloves, hoods, and suits of corrosive-resistant or fire-resistant materials. Draft standards are now being prepared.



U. S. Maritime Commission Photo

Here the stern sideshell assembly of a standard type ship is being placed.

Standard Models Speed Shipbuilding

by H. Gerrish Smith

President, Shipbuilders Council of America

APPLICATION of the principles of standardization has done much to expand the productive capacity of the American shipbuilding industry, now engaged in producing more deadweight tonnage of merchant ships than has ever been produced in a single year by any nation or group of nations.

The production, in greater numbers than ever before, of merchant ships of an identical character has dramatically demonstrated to the industry the special advantages to be gained in standardization of types. Repetitive methods alone have enabled the industry to complete a 10,000-ton merchant ship in thirty days, now nearly a routine event but considered impossible a few years ago.

Speed Urgent to Meet War Needs

It has always been well known that if a shipyard could concentrate its facilities on a limited number of types of ships the principle of multiple production could be applied, with a consequent saving of time and cost. As a matter of fact, there was some duplication of types in shipbuilding in the first World War and some excellent delivery records were made. Speed of production at that time, however, was less important than at the present time, as those shipbuilding programs were only in their early stages of completion when the war ended. It is only in the much larger program of the present war, where the urgency of the war needs has placed a new and increased value on the element of time, that it has been possible to obtain the full advantages of multiple production.

What the shipbuilding industry has now achieved is "multiple" and not "mass" production. The benefits of mass production are denied us for obvious reasons. Thousands or millions of a product, such as automobiles, safety razors, farm machinery, or typewriters, for example, readily lend themselves to mass production methods. Not so with ships. A ship is a highly specialized, made-to-measure unit. Back in peacetime it was rare for more than two or three ships of the same design to be building at the same time. Under such conditions, there was little in the way of repetitive work.

In the construction of a million automobiles, there would be complete economic justification for the purchase and use of a special machine tool at a cost of $100,000, if it could produce a single part involving a cost of only ten cents on each car made. When only 100 ships are built to a single design, however, this same machine tool, even if built to make a small unit of the ship, would cost $1,000 per ship, a prohibitive element of cost.

The advantages of multiple production—standardization of the type of ship—start with the testing of the ship's model in a model basin. This testing enables us to secure the best outer form, which sharply controls the horsepower required to operate the ship. Where the cost of this testing can be distributed over a large number of ships, it is possible to make and

test a large number of models, thus assuring the very best and most efficient form. In the case of single ship, this would be economically unsound.

The next advantage gained is in the matter of plans. A set of precise plans for a ship may cost $500,000. If only one ship is built, that ship must absorb the entire sum as part of its cost. However, if 100 ships of this one type are built, each ship would absorb only 1 per cent of the plan cost.

Costs Reduced

Even a second ship of identical design reflects a cost reduction and shorter building time. On one group of contracts with the Maritime Commission for C-type ships, the average fixed-price bids for each of four vessels of a group was from 10 to 16 per cent lower than for the construction of but one vessel.

Wooden patterns for the production of castings, and templates from the mold loft used in the fabrication of steel structure on one ship, can be used on the building of many ships. Naturally, the cost per ship decreases in direct proportion to the number of times these units are used.

The actual cost of ordering and following up the delivery of material for each of a large group of ships of the same type is reduced as the number of ships of the type increases.

In the construction of one or two ships of a type, serious delays may occur if there is any rejection of material involved. As a rule this means the order will have to be duplicated, a time-taking angle that it is desirable to avoid. However, when many ships of a type are being built, there is a natural accumulation of materials, thus making it possible to replace a defective part without delay, as all parts are duplicate and interchangeable.

The marine field enjoys advantages similar to those the shipbuilding industry has experienced. The reciprocating engine for the Liberty ship is being built by many concerns, to the same design. Machinery from any of these plants is suitable for installation on any Liberty ship, wherever built. The same situation applies with equal force to any of the other component parts of a Liberty ship.

Duplication of type of ship has greatly stimulated the flow of essential materials. It has facilitated subcontracting with small war plants, as these plants are willing and eager to undertake the construction of a substantial number of parts or units. The manufacture of a few parts of the same nature would not attract their interest.

Planning Schedule Made Easier

Good shipbuilding practice incorporates a planning schedule which gives the procedure an orderly and determined pace. This schedule includes the time of receipt of material and the chronological dates on which the fabrication of each part in the shops, and its installation on the ship, should take place. The more ships that are built to the same pattern, the smoother and more efficient can the planning schedule be made.

"Know-how" on the part of the employee is a primary asset. This can best be gained when workers are engaged in making many ships or fabricated parts of an identical nature. As they gain in experience, they gain in confidence, skill, and speed, thus saving time—economy in its best form.

Repetitive work that generates "know-how" has resulted in some notable achievements. On one order of 18 ships of one type, the actual number of man-hours required to install the main engines on the last vessel was 25 per cent of the hours required for the same installation on the initial ship. Time required for the installation of main-engine shafting on the eighteenth ship was less than one-third that of the first. On seven other important installation jobs the man-hours required on the eighteenth ship averaged less than one-half of the time required on the first ship.

The Liberty ship is undoubtedly the best example of what multiple production principles can accomplish. It has been built in greater numbers than any ship of appreciable tonnage. The new yards where these ships are being built have been laid out with multiple construction in view, with large sub-assembly spaces and heavy handling equipment to handle large sub-assembly parts.

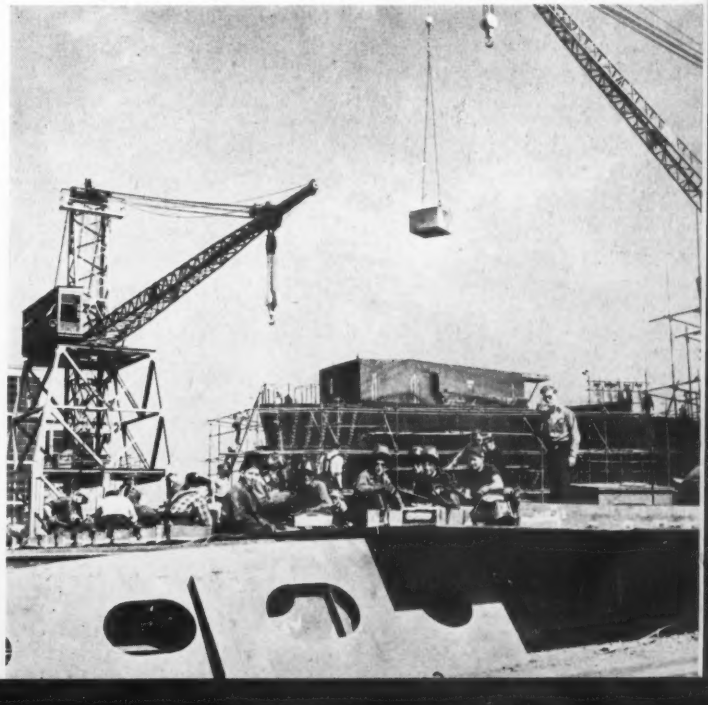
Sub-assembly More Advantageous

While sub-assembly readily lends itself to the construction of one ship, its real advantages are enjoyed as the number of vessels of a type increases. Under such circumstances individual sub-assemblies can be considered as separate units. It is then sound economy to invest considerable sums for the building of forms to check the accuracy of the unit and to prepare detailed drawings extremely carefully worked out so as to show the method of assembly and the measurements that must be checked to avoid interference and to assure that the assembled unit will fit properly into its place in the ship's structure.

Sub-assembly has the advantage that it permits work to be performed in open spaces removed from the ship, thus avoiding the natural loss of time which inevitably results when work is carried out in congested areas aboard the ship itself. In addition, it has a further advantage of requiring fewer employees and less time. Sub-assembly is adaptable to welding, which

A prefabricated piece of deck housing being hoisted by crane.

U. S. Maritime Commission Photo



has largely replaced riveting on Liberty ships and many other craft. Sub-assembly also makes possible more machine-welding; it likewise permits of more down-welding—thus speeding up this phase of shipbuilding.

In other days outfitting work was invariably done on board the ship. Sub-assembly practice, however, has made it possible for this to be done to a considerable degree on premises adjacent to the ship. This includes such items as installation of airports, windows, doors, piping of various types, some electrical installations, and painting. Thus, we avoid the cost and time involved in erecting staging and temporary lighting installations.

Standard Ships Ready for Service

A factor of saving not generally associated with the advantages of multiple production on ships of one character is the elimination of long and costly trial trips. True, these must be made on the first two or three ships, and the necessary post-trial adjustments made. Later, the ships leave the builder's dock under their own power and the trial run consists of the short period enroute to the delivery point. Readiness to go into service is a distinct advantage, as judged from any aspect, and the fact that the ships are ready for sea duty when delivered is a tribute to the skill and ability of the shipyards.

Shipyard employment has increased from about ten to twelve times since the start of the war shipbuilding program. It has been necessary to train hundreds of thousands of men and women. Making ships of the same type has made this training program easier and simpler. As a result, it is possible to transfer a worker from one ship to another, and the worker can start to produce without delay. On repetitive work, a smaller percentage of highly skilled workers is needed.

Find Many Advantages

It would be possible to cite hundreds of detailed advantages incident to making ships of the same type. It is impossible to explore each of these, but a few which are of major importance include:

The same building way, including blocking, staging, shoring, and access ramps to the ship can be constructed with special care for the initial ship, and with slight changes can be utilized on subsequent ships.

Launching ways, together with much of the packing and special equipment used in launching can be used on many ships of the same type. Temporary wiring for power and light and also water piping for fire protection and for compressed air can be installed in the staging and alongside the ship for the first ship of a type, and can be used with minor modifications for all ships of a type.

Definite and controllable storage schedules for raw materials and prefabricated parts can be arranged and, in many instances, this serves to save space and lowers costs in handling.

A mock-up of wood of sections of a ship can be erected either in the shipyard or in the shops, with foundations for machinery and fittings, and with rough templates of machinery and fittings themselves so that piping arrangements can be laid out within this mock-up, and prefabrication made that will insure a proper fit of piping in sub-assemblies or in the ship itself. Special handling gear for assembled parts or machinery made for the first ship can be used for many or all ships of a type.

Dies for specially curved plates can be made so that these plates can be pressed into shape with accuracy. Dies, jigs, and fixtures can be extensively used in the production of small parts, as their costs, which is high, can be distributed over many ships. This would not be permissible in the case of construction of only a very few ships of a type.

Attempts at standardization of fittings, and of a degree of standardization in hull construction, have been attempted in this country and abroad for many years, but with limited success. In peacetime an obstacle to standardization of design is the service in which a ship operates. The design is controlled by the distance of the voyage, time of turn-around, depth of water in the harbor it enters, and the type of cargo it is to carry.

Peacetime Standardization Possible

The writer of this article has felt for many years, however, that a degree of standardization of cargo ships in peacetime is possible, although he is well satisfied that complete standardization is not practicable. Ship owners add only a few vessels at a time to their fleets, and they are loath to depart from definite features of construction which prevail in existing ships in their fleets and which have been found satisfactory in service.

The American Bureau's registry of American shipping shows many ships of approximately the same size and the same speeds that vary in length by only a few feet and with little variation in beam or draft. It does seem practicable that the hull structure of such a group of ships could be standardized so as to permit of a standard form of hull, thoroughly tested in the model basin to assure the most efficient design, with a layout of machinery spaces to permit the installation of any type of machinery desired by the operator. Such vessels would be practically standard so far as bulkheads and decks are concerned, but necessarily with internal arrangements to suit the particular service the operator requires. A recognition by the ship owner that even a partial degree of standardization will save him money in the cost of his ship should be sufficient to secure his cooperation in this matter.

A study of the possibility of standardization was conducted by the Shipbuilders Council of America over a considerable period, and the conclusion was reached that with the hearty cooperation of ship owners some standardization as outlined herein is practicable. This subject has been a matter of much study in Great Britain in the past and is receiving attention at the present time by the British Select Committee on National Expenditures, as shown in their periodic reports which appear in the British technical press.

The Maritime Commission has made some very definite advances in this respect in its design of the C-type ships and tankers, and the fixed-price bids for the construction of vessels of these types even in groups of four or five have shown cost reduction as stated.

Savings May Reduce Subsidy

The United States is definitely committed by Congress to a policy of operation of American-built ships under the American flag in our own foreign trade. Such participation, however, for a long time in the future as in the past, will depend upon a subsidy to the private ship operator to cover the higher cost of building in the United States and the higher cost of operation under the American flag. The amount of such subsidy will be largely controlled by the cost of the ships. The substantial savings in cost and the reductions in subsidy that can be brought about through a degree of standardization merit consideration by every one concerned in the development and permanence of our American Merchant Marine.

Coonley Describes Conservation Methods At Canadian Meeting

Changes in Specifications, Simplification, and Standardization Are Important Methods for Conserving Materials

THE changing complexion of conservation problems caused by the war, and the steps taken to conserve materials, featured the joint meeting of the American Society of Mechanical Engineers and the Engineering Institute of Canada, in Toronto, Ontario, October 1. Not only avoidance of waste but also modification of design, substitution of materials, simplification, and standardization of design and specifications were the method cited for conserving materials.

Speakers at this session on "Conservation of Materials" were C. B. Stenning, Canadian chairman, Joint War Production Committee on Conservation, and Assistant Coordinator of Production, Department of Munitions and Supply, Ottawa; and Howard Coonley, chairman of the Conservation Division, War Production Board, Washington, and president, the Walworth Company, New York. Mr. Coonley's subject was "The Continuing Need for the Conservation of Resources."

"Conservation must be carried on until every Axis nation is subdued and the world can be assured of a lasting peace," said Mr. Coonley. "And after peace there will be the problems of reconstruction for the war-torn countries, which will require conservation for their solution. And after peace and reconstruction there will remain the age-old problems of enough to feed, to clothe, and to shelter all mankind. Conservation is eternal.

"Even in countries so rich in material resources as the United States and Canada, such huge quantities of materials, facilities, and transportation as a war of world-wide proportions require do not lie ready for our immediate use. The exigencies of war compel us to plan, design, construct, convert. We must make two blades of grass sprout where one grew before. We must stretch. We must conserve."

Outlining steps taken to organize the nation for conservation, Mr. Coonley said:

Substitution Program

"In the early stages substitution was used as a means of relieving excessively heavy demands on certain materials that were insufficient to take care of our rapidly expanding production program. With the loss of the Malay Peninsula and the Dutch East Indies, vast reservoirs of precious materials were cut off almost over night, making it necessary for us to find new sources of supply or to discover ways and means of using available materials to replace those that were no longer obtainable.

"Three general methods were used in achieving substitution. The first was a complete change of material. For example, when our aircraft program made aluminum a very critical material, we experimented with substitutes for aluminum in such products as canteens, and were able to develop a satisfactory stainless steel canteen that has been accepted by both the Army and Navy. In other cases where a complete change of material was not possible we were able to accomplish our purpose by using less of the critical material in question. An example of this type of substitution would be found in galley equipment and mess equipment where we were able to substitute stainless clad steel in place of solid stainless steel, thereby saving better than 90 percent of the stainless steel involved. The third type of substitution consists of down grading the same material for a given product."

Silver Substituted for Copper

Virgin copper has from the first been one of the critically short materials, Mr. Coonley declared. He described the use of silver as a substitute for copper in bus bars. Most of the silver bus bars are being used in the new aluminum and magnesium plants and to date about 20,000 tons of silver bus bars have been certified, saving 16,000 tons of copper.

The Conservation Division furnished the Treasury Department with a revised specification on nickels using an alloy of 56 percent copper, 35 percent silver and 9 percent manganese, instead of 75 percent copper and 25 percent nickel in the original coin, thereby entirely eliminating the use of nickel.

In cartridge cases, substitution had to be made in order to give the Army and Navy their requirements in ammunition. After many obstacles were overcome in the fabrication of a satisfactory steel case, the .45 caliber size ammunition was completely converted from brass to steel, with a production of over 300 million per month. At present the .30 and .50 caliber sizes are also in production at a silghtly lower rate, and we have been successful in furnishing the 10.5 mm case, the 20 mm case, the 40 mm case, and even as large as the long 3-in. gun case (Navy), all of which have been certified for combat use and are now in full production. At the present rate there is a saving in brass of approximately 200,000 tons a year, and this figure is rising rapidly.

Change to Die Casting Process

Mr. Coonley said that in the use of die castings as a conservation measure hundreds of items have been changed from screw machine products, forgings, sand castings, and other methods of fabrication to the die

Courtesy Office of Emergency Management

Steel is substituting for brass in many types of ammunition cases.

casting process. The expanded use of die castings with their characteristic high-speed production and low scrap loss has represented huge savings in critical materials, manpower, and machine hours.

"Specifications provide an important means for conservation," Mr. Coonley said. "A purchase specification is simply a detailed statement of the requirements that must be met by the product under consideration. The United States Government is undoubtedly the largest buyer that the world has ever known, and it is all-important that the quantity and performance of all products purchased be a fair exchange for the money paid for them.

Federal Specifications Important

"The system of Federal Specifications was established to standardize the grades and sizes of products purchased by more than one Government Department. They are prepared by 71 Federal Specification Committees composed of representatives of the various Government Departments. The Conservation Division is represented on all these committees. Two methods of conservation are considered here: First, by issuing amendments limited to the war period specifying substitutes in place of critical materials needed in the War Program; second, by issuing Emergency Alternate Federal Specifications to indicate alternate materials for consideration.

"In the design of modern equipment, advantage was taken of the superior properties provided by modern materials of construction, such as aluminum, copper, brass, alloy steels, rubber and plastics, to provide greater durability and greater convenience, and in many cases, lower cost," Mr. Coonley continued. "With these materials so urgently needed for the war program, it has been necessary to replace them by others, which, while not quite as satisfactory, will still do the job. Many Government Specifications, therefore, have been reviewed and changed to specify available materials in place of those that are short.

"For instance, specifications for bronze valves were changed to call for cast iron, sometimes with bronze seats. Specifications for large search lights were changed from aluminum casting to sheet steel. Specifications for fire-hose couplings were changed from high tin bronze to malleable iron for shore use, and low grade bronze for shipboard use. Specifications for wire screen cloth were changed from commercial bronze to galvanized steel wire. The Federal specification covering tissue paper, a special Japanese tissue no longer available, was revised to describe a new type of American tissue. Specifications for a number of rubber products have been issued as emergency alternate specifications to allow the use of reclaimed rubber.

"Another step in conservation was realized through the establishment of national emergency steel specifications, with the objective of standardizing and simplifying specification requirements for steel mill products, simplifying dimensional requirements and conserving critical ferro alloys by adjustments in composition. Simplification of the specification field has been a very important contribution to increased production.

Simplification and Standardization

"Simplification as we conceive it may be defined as the elimination of those items, types, sizes and colors of products which do not serve the war effort; in fact, many of which do not serve any economical purpose. In most instances they are a positive hindrance to the flow of essential products to the Armed Services and to civilians. To make simplification effective, a certain amount of standardization is usually necessary. Often it is only a single element in a product that must be standardized in order to achieve the necessary degree of simplification. Another important role played by standards is to provide for interchangeability, particularly in combat equipment. A large part of such equipment is being shipped to far distant lands. This equipment must be repaired quickly and on the field of battle.

Interchangeability of components of tanks, trucks, and jeeps reduces the necessity for creating large floating stocks of repair parts. Much progress has already been made in this field, and more is in prospect.

"One of the most effective means of promoting conservation has been through coordinating committees. An inter-agency Conservation Coordinating Committee set up under the chairmanship of the Director of the Conservation Division was composed of the heads of the conservation activities of the Army, Navy, and Maritime Commission, and the chiefs of the three branches of the Conservation Division. Later this Committee was expanded to include representatives of the Office of Lend-Lease Administration, Treasury Procurement, Board of Economic Warfare, Aircraft Production Board, Great Britain and Canada. The effectiveness of this method of interchange of information has already been demonstrated.

"One of the most effective means of achieving conservation is an appeal to the patriotism and good sense of the individual through the radio and press, indicating definite ways and means by which savings can be accomplished. This method is being given increasing emphasis in the last few months, expedited by the unselfish cooperation of industrial, commercial, and engineering groups.

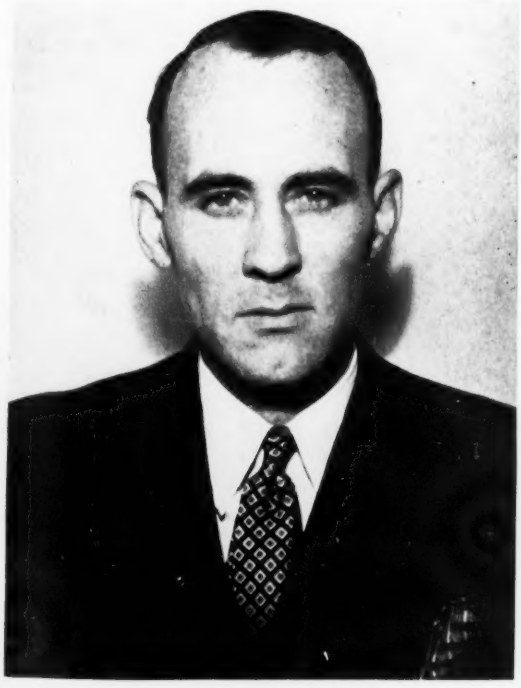
"Recently we have reviewed the responsibilities of our Division and developed a revised policy to meet these changed conditions. As certain materials become adequate, our program, to some extent, must be put into reverse gear. Yet we conceive it as our duty to safeguard and guide the relaxation of controls as carefully as they were designed."

Dan F. Hayes Is New ASA Staff Member

THE American Standards Association has acquired a new staff member in the appointment of Dan F. Hayes. His work will be connected with the general safety code program of the ASA and in particular with the program of the committee on protective occupational clothing.

Mr. Hayes brings with him seven years of practical safety engineering experience, having been Safety Engineer with the Travelers Insurance Company, Engineering Inspector with the City of New York, and recently Safety and Health Supervisor at the Lake Success plant of the Sperry Gyroscope Company.

He is a member of the American Society of Safety Engineers. He is also active in safety training work, and is on the current ASSE Program Committee of the Metropolitan Chapter of the ASSE, New York. Mr. Hayes is a graduate of Rensselaer Polytechnic Institute in Mechanical Engineering, and of Brooklyn Law School.



Dan F. Hayes

Revise Standard Color Card For Army's Thread

The U. S. Army standard color card showing the official standard shades of olive drab, khaki, and drab sewing threads has been revised by the Textile Color Card Association at the request of the Quartermaster General of the United States Army. The new edition, just issued, shows six colors in thread tassels, and lists opposite each sample the various items for which each thread color is used. For example, a new shade, Shade S-1 (U. S. Army olive drab) is "used for sewing olive drab items of clothing or equipage made of cloth, cotton, synthetic, resin-coated; cloth, cotton, oil-treated; cloth, cotton, impermeable; all fabrics in olive drab (shade No. 7); headnets, mosquito, O.D. (shade No. 6) and all items fabricated from material in olive drab shade No. 4 (jungle equipment shade)."

Margaret Hayden Rorke, managing director of the Textile Color Card Association, explains that the Quartermaster General's Office distributes a large quantity of this Revised 1943 Second Edition Thread Card to its various depots throughout the country. Thread manufacturers and other firms making clothing or equipage for the United States Army likewise make wide use of this reference card, which may be secured from the Textile Color Card Association, 200 Madison Avenue, New York 16, N. Y.

Smith and Craugh Head Safety Code Correlating Committee

W. R. Smith

W. R. SMITH, safety engineer with the Public Service Electric and Gas Company of Newark, New Jersey, has been elected the new chairman of the ASA Safety Code Correlating Committee. J. P. Craugh of the Board of Standards and Appeals, New York Department of Labor, Albany, New York, is the new vice-chairman.

Mr. Smith, who has been associated with the engineering and construction work of the Public Service Corporation of New Jersey for more than 25 years, has been safety engineer since 1938. He has been a member of the Safety Code Correlating Committee, representing the ASA Electric Light and Power Group, since 1939.

As a member of the American Institute of Electrical Engineers and the Edison Electric Institute, Mr. Smith has been active in the accident prevention work in the electrical industry. He is past chairman of the Accident Prevention Committee of the Edison Electric Institute, member of the Electric Light and Power Group which nominated him for membership on the SCCC. At the present time he is a member of the Board of Directors of the American Institute of Electrical Engineers and chairman of the Institute's Committee on Safety.

Mr. Craugh, who represents the International Association of Industrial Accident Boards and Commissions on the SCCC, has been a member of the Board of Standards and Appeals of the New York State Department of Labor since its creation in 1937. He has actively supervised the preparation and promulgation of all industrial codes adopted by the Board. These Codes have the full force and effect of law in New York State.

Members of the Executive Committee of the Safety Code Correlating Committee are:

L. F. Adams, General Electric Company, Schenectady, N. Y., representing the National Electrical Manufacturers Association

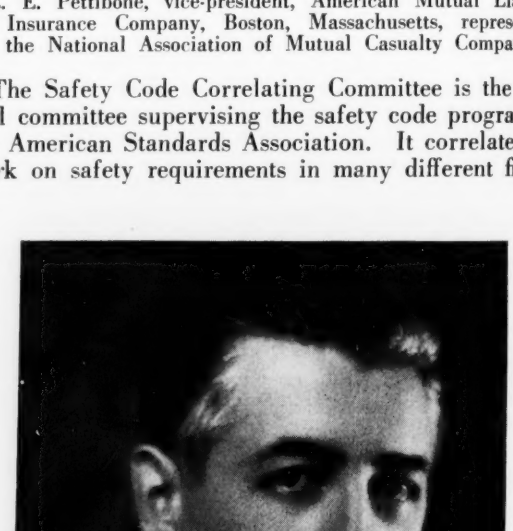
W. T. Cameron, chief safety adviser, Division of Labor Standards, United States Department of Labor, representing the Division of Labor Standards

H. L. Miner, E. I. duPont de Nemours & Company, Wilmington, Delaware, representing the National Fire Protection Association

W. S. Paine, Aetna Casualty & Surety Company, Hartford, Connecticut, representing the National Conservation Bureau

C. E. Pettibone, vice-president, American Mutual Liability Insurance Company, Boston, Massachusetts, representing the National Association of Mutual Casualty Companies

The Safety Code Correlating Committee is the general committee supervising the safety code program of the American Standards Association. It correlates the work on safety requirements in many different fields.



J. P. Craugh

ASA Asks for Comments On Proposed Work Clothes Standards

EIGHTEEN hundred copies of four proposed American War Standards for women's industrial clothing have been distributed to clothing manufacturers, plants employing large numbers of women, labor groups, women's groups, and Federal and state agencies for study before being considered by the American Standards Association for final approval. The proposed standards were prepared by an ASA War Committee made up of representatives of garment manufacturers, retail stores, big war plants whose workers must be outfitted, safety engineers, and agencies of the Federal Government, as well as liaison representatives from the Office of Price Administration and the War Production Board.

WPB and OPA Requested Project

The ASA War committee on women's industrial clothing was organized at the request of the War Production Board and the Office of Price Administration when the job of clothing the thousands of women in war production became the number one headache of many plant managements.

At first, men's work clothes were used by the women welders, burners, fitters, and machinists who replaced men in such jobs. With these garments, however, women workers complained of incorrect sizing and fit. It was difficult for factory managers to get women to wear them. Dissatisfaction and accidents led to other efforts at solution.

Some of the largest employers of women worked out individual specifications for clothing for their workers. Private industry, the War Department, the Navy, the Maritime Commission, each did the same thing. Manufacturers also developed certain types of clothing. Since there was no agreement as to the most suitable types of garments, or on questions of serviceability, or on safety features, one manufacturer's guess was as good as another's.

Material and Labor Wasted

The result was a multitude of specifications. This led to a waste of materials and production space and labor, in the face of increasing shortages of all three. There was an overall lack of functional clothing. Manufacturers did not know what to make. Distributors did not know what to stock and sell. Some lines were over-simplified. Women welders refused to wear the heavy leather trousers and aprons that did not fit. Fancy cuffs, large buttons, and badly designed pockets on other garments constituted safety hazards. Improper materials failed to stand up under necessary launderings, or became so quickly saturated with oils that they injured the skin of the workers. Unsatisfactory dyes ran onto the girls' bodies or underwear. Good material was wasted by being used in shoddy or skimpy garments which did not wear well and had to be replaced.

Because the American Standards Association had had experience in working with safety engineers, with the textile trades engaged in making these garments, and with the war plants and labor groups that were using them, the War Production Board and the Office of Price Administration asked the American Standards Association to undertake the job of developing specifications for women's industrial clothing that would assure satisfactory fit, durability, safety, and thus conserve scarce materials.

They requested the ASA to provide standards for all necessary and widely used items of industrial clothing for women, giving special attention to minimizing accident hazards; conserving critical materials and production facilities; and simplyfying the problems of distribution and pricing. Specifications were to be such that the resulting clothing would be attractive, would fit, would be functionally correct, would be safe, and

The Proposed Standard Coverall L17.2-3A

would conserve manufacturing facilities—both material and labor.

The American Standards Association formed a competent and representative committee, bringing into the work those groups that had previously made individual efforts to solve the problem.

This committee decided just what work should be undertaken. Subcommittees were set up, meetings were held, garments were made, tried on, corrected, remade, tried again.

The four draft standards now being studied by the individuals and groups concerned are the results of this work to date. These drafts will be revised on the basis of the criticisms and suggestions received before they are approved as War Standards.

ASA War Committee On Women's Work Clothes

Miss Dorothy Ashworth, Montgomery Ward & Company
J. B. Bachofer, Donnelly Garment Company
S. N. Becker, The Sterling Company and Reliance Manufacturing Company
A. M. Berger, Hoover Manufacturing & Sales Company
(M. C. Goldberg, Keystone Coat & Apron Manufacturing Company, *alternate*)
Miss Helen Blanchard, Department of Labor, Women's Trade Union
H. B. Duffus, Westinghouse Electric & Manufacturing Company
Miss Lillian Erskine, Department of Labor, Division of Labor Standards
Ephraim Freedman, R. H. Macy & Company, Inc.
Walter Geiger, Louis Geiger, Inc.
(Albert Trattner, *alternate*)
Major E. R. Granniss, War Department, Office of Provost Marshal General
(Carl C. Clements, *alternate*)
T. A. Hennigan, Rice-Stix Dry Goods Company
N. K. Howard, National Conservation Bureau
Carter Kendall, Bethlehem Steel Company
Lester Klipstein, Sun Valley Togs, Inc.
E. B. Landry, Navy Department
(Lieut. Comdr. G. E. Twining, *alternate*)
M. Lonie, National Bureau of Standards
Miss Ellen D. McKeon, American Mutual Liability Insurance Company
Jonas H. Mayer, American Linen Supply Company
(Albert Gitlow, Linen Supply Association of America, *alternate*)
Mrs. Margaret Mettert, Department of Labor, Women's Bureau
Major W. J. Niederauer, U. S. Army, Ordnance Department
John M. Roche, Maritime Commission and National Safety Council
M. C. Schrank, M. C. Schrank Company
(I. N. Epstein, *alternate*)
Miss Clarice L. Scott, Bureau of Home Economics
W. R. Shields, Calco Chemical Division, American Cyanamid Company
Richard Taylor, Wright Aeronautical Corporation
(Miss Helen Shell, *alternate*)
Miss Ruth Young, Department of Labor, United Electrical, Radio & Machine Workers
(Miss Katherine Beecher, U. E. News, *alternate*)

Liaison, representatives of governmental agencies:

OFFICE OF PRICE ADMINISTRATION
Standards Division—R. E. Van Brunt, Mrs. M. D. Hale, Jean Fulcher
Price Division—E. I. Levinson

WAR PRODUCTION BOARD
Office of Civilian Requirements—Sidney Frank, Jr.
Safety & Technical Equipment Division—Mark Bulot
Textile, Leather & Apparel Division—G. R. MacDonald

The garments made to these proposed standards have not been especially designed, but represent the types of clothing that have proved particularly well adapted to particular jobs.

In determining the size ranges and body measurements upon which the garment specifications are based, the committee used a study of women's measurements carried out by the U. S. Department of Agriculture and printed in Miscellaneous Publication 454.

Except for four garments all the specifications have been prepared for two basic size classifications:

Misses' 10 to 20
Women's 38 to 50

The exceptions to this are as follows: the bungalow apron is given in four sizes—extra small, small, medium, and large. The industrial apron has three sizes—small, medium, and large. Slacks and dungarees are sized in accordance with waist measurements.

It was recognized by the size and specification subcommittee that the wrap-around service apparel design (L17.1-B) is usually graded in regular sizes from 32 to 48, but it was the opinion of the Committee that, as far as possible, the sizes should be the same for all garments, and that they should all be based upon the same scale of body measurements.

Coverall, overall, slack, and dungaree specifications are given in three body and three leg lengths. These lengths were adopted because of the character of the garments, and because of the need for conserving fabrics. The "short" sizes are made for women up to 5 ft 2 in. in height; the "regulars" up to 5 ft 6 in. in height; the "longs" over 5 ft 6 in. up to 5 ft 10 in. or 11 in. If the "regulars" were made for taller women than indicated above, then a considerable wastage of material would be encouraged, because the length that would have to be adopted to cover the requirements of the taller person would be excessive in the great majority of cases.

Coveralls Offer Special Problem

Another reason for specifying garments in three lengths was the special problem involved in fitting coveralls, particularly the fitting of the vertical trunk (measured around the body from shoulder to shoulder through the crotch). Too frequently, coveralls with vertical trunk measurements for the taller figure are ugly (baggy) in appearance, and unsatisfactory in fit for persons of average height, and more particularly so, for shorter persons.

To overcome such objections, it was realized that the most satisfactory solution was three lengths. Further, manufacturers who have had experience with three lengths in slacks have found the fit considerably improved.

The standards give complete information about the garments including the following:

A. A sketch.
B. A description of the basic features.
C. Size dimensions with tolerances.
D. Methods of measuring (sketches where necessary).
E. Manufacturing details—seam finishes, closures, buttons, number of stitches per inch, linings, hems, etc.
F. Methods for identifying and labelling the several garments.

ASTM Acts On New Standards

SEVENTEEN new specifications and tests, including emergency standards, were approved by the American Society for Testing Materials at a meeting of its Committee on Standards August 30. Twenty-three standard and tentative specifications were also given regular or emergency revisions by the committee. Of particular significance are a comparison test for color of Army motor fuel; three new specifications covering clad plate (stainless sheets bonded to steel plates); several specifications for nonrigid plastics of various compositions; new hardness conversion tables for steel; and two new emergency specifications for insulated wire and cable with synthetic rubber compound.

Metals

Steel

Through the work of a special group in its Section on Indentation Hardness, ASTM Committee E-1 on Methods of Testing completed the new Tentative Hardness Conversion Tables for Steels (E 48—43 T) giving relationship between diamond pyramid hardness, Rockwell hardness, and Brinell hardness. The tables are based on extensive tests on carbon and alloy steels, mostly in the heat-treated condition, but have been found to be reliable on practically all constructional alloy and tool steels in the as-forged, annealed, normalized, and quenched-and-tempered conditions, provided they are homogeneous. Such special cases as high manganese steel, 13 percent chromium, 8 percent nickel steels, and other austenitic steels, nickel-based alloys, as well as constructional alloy and tool steels in the cold-worked condition, may not conform to these relationships with the same degree of accuracy as the steels for which they are intended.

This is the second standard giving conversion tables developed by the special committee; the first covered cartridge brass (E 33—42). The new tables covering steel are the result of cooperative efforts with the Society of Automotive Engineers and the American Society for Metals.

Committee A-1 on Steel recommended emergency alternate provisions in two of its plate specifications, A 89 and A 70 (low tensile strength carbon plates of flange and firebox quality and carbon-steel plates for boilers and other pressure vessels). These provide a slight increase in sulfur, and in Specification A 70 also provide a higher tensile range, in view of the difficulty in obtaining melting stock and fuel low in sulfur. The first of these standards is an American Standard, with the ASTM as proprietary sponsor and responsible for revisions.

An emergency action involving electric-resistance-welded heat-exchanger and condenser tubes, EA—A 214, will permit the use of an electric tester in lieu of the hydrostatic test. Also, in the interest of increased production, the consumer may permit unnormalized material with consequent modifications in the flattening and hardness test. The electric tester, which can detect small defects which either partly or completely penetrate the tube wall, was developed by Republic Steel Corporation, Steel and Tube Division, using a basic Sperry process. Large amounts of the tubing inspected by the electric tester have been fabricated.

Stainless Steels

Through a special subcommittee, Committee A-10 on Iron-Chromium-Nickel and Related Alloys completed three new tentative specifications for clad sheet, strip, and plate, as follows: (*a*) corrosion-resisting chromium steel; (*b*) corrosion-resisting chromium-nickel; and (*c*) nickel and nickel-base alloy. The standards were developed as the result of the fact that the Boiler Code Committee desired standards for these materials used in construction of vessels subject to code rulings. In order that such requirements could cover material for

One of the processes which may be affected by changes in ASTM steel specifications.

Courtesy Jones & Laughlin

other uses as well, the special subcommittee was organized. This clad material involves plate of a carbon or low-alloy base steel to which is continuously bonded, on one or both sides, a layer of the stainless material. The material may be a single-clad or double-clad product. In the specifications the types of stainless material are covered by reference to other ASTM specifications. For example, in the nickel and nickel-base standard, the cladding metal must conform to nickel, nickel-copper, or nickel-chromium-iron alloys established by committees functioning in the non-ferrous metals field. Tests include tensile and bend tests. The physical properties as determined by tensile test are to equal the minimum requirements for the base steel specifications. On the thinner material the test specimen is the complete thickness, whereas on the thicker material the standard ½-in. round tension test specimen can be used providing the ratio of clad material to base material is maintained.

Magnetic Properties

Essentially, the revisions in the three tentative test methods approved on the recommendation of Committee A-6 on Magnetic Properties and the tentative revision of the Standard Methods of Test for Magnetic Properties of Iron and Steel (A 34—42) are to provide modified or additional procedures which can be tried out before the methods are adopted as standard. One action incorporated the requirements on alternating-current tests at low inductions covered in the general tests for magnetic properties (A 34), in the test for incremental permeability and core loss of flat-rolled magnetic materials (A 258). The new test will be entitled "Normal and Incremental Permeability and Core Loss of Flat-Rolled Magnetic Materials at Low Alternating Inductions, using 28-cm Specimens."

A third test method was added in the test for permeability of feebly magnetic materials (A 259). In the tentative test (A 257) covering permeability and core loss of flat materials, a note is being added in relation to strain-sensitive materials indicating that clamping should not be used and that care should be taken to reduce sagging and strains in the center portion of the strip.

Non-Metallic Materials

Paint Materials

Of the two new specifications approved on the recommendation of Committee D-1, the first covers red and brown iron oxide pigments which supersede a standard that covered mineral iron oxide (D 84); and the second gives new requirements for methyl ethyl ketone, thus adding another to the several solvents covered by ASTM specifications. Three classes of iron oxides are covered in the first-named specification: those considered commercially pure; those containing from 70 to 97 percent iron oxide and those with lower percentages, 40 to 70. The new solvent specification gives requirements on specific gravity, color, odor, acidity, etc.

Another action taken by Committee D-1 was the addition of two grades, E and F, in the specifications for orange shellac and other lacs. This standard has been reverted to "tentative." New Grade E usually occurs in the form of circular disks and is known as pure button lac, while Grade F is dark garnet in color. It sometimes is manufactured in admixture with rosin and as a dewaxed lac.

Waterproofing and Roofing Materials

The difficulty of obtaining condensers constructed of block tin has resulted in emergency provisions in the test for bituminous mastics, grouts, and like mixtures, EA—D 147, covering a tinned copper apparatus with a glass condenser. Through emergency provisions, EA—D 228, in the test for asphalt roofing, cap sheets, and shingles, Committee D-8 is bringing certain requirements in line with Limitation Order L 228. An emergency provision for roofing surfaced with powdered talc or mica, EA—D 224, permits reduction of the 60-lb dry felt classified as Type 1, Grade A, to a 58-lb minimum, in accordance with order L 228, and the revised emergency provision EA—D 249a, roofing surfaced with coarse mineral granules, will permit a 4-in. selvage edge.

Petroleum Products

The new emergency method of test for color of U.S. Army motor fuel by means of an ASTM color standard, ES—32, exemplifies the willingness of the Society and its committees to work closely with the Government services, and the promptness with which the Society can move to provide an urgently needed standard. This new method, which incidentally involves the marketing of a sample, was requested by the Specifications Branch of the Army which needed a rapid procedure for determining whether motor fuel color conformed to the requirements in the Army Specifications No. 2-103. The color standard developed through the intensive work of H. M. Hancock, chairman of Committee D-2's Subcommittee VI on Color, is a 4-oz sample bottle with an aqueous solution of inorganic salts. The colorimetric characteristics are carefully specified and the National Bureau of Standards certifies the color of each batch of material.

The color standard, with a copy of the printed emergency method, can be obtained at 85 cents each from the American Society for Testing Materials, 260 South Broad Street, Philadelphia, Pa.

Rubber Products

Two new emergency specifications covering insulated wire and cable, ES—33 and ES—34, have been accepted. These standards were rushed through by Committee D-11, since a limitation order effective after August 15 was being issued to prevent the use of crude rubber in the manufacture of insulation or jacket compound, and synthetic and reclaimed rubber had to replace crude rubber for these particular requirements. Earlier, Committee D-11 had developed emergency specifications for chloroprene sheath compound (ES—28 and ES—30) and new specifications for polyvinyl insulating compound (D 734) were approved at the June Annual Meeting. The new specifications, which permit the use of a compound known as Government Rubber, type GR-S, are now available for industry guidance and performance references in WPB orders.

While other ASTM specifications are being continued as references in WPB order R-P, they are for certain uses of the armed forces only. Commercial users and many land installations of Government forces will use

Courtesy Soap and Sanitary Chemicals

Soaps are offering special problems because of shortage of fat. Emergency provisions for chip soap and powdered soap have been adopted by ASTM.

the new specifications. Prompt development of these standards was handled through Subcommittee V on Insulated Wire and Cable of Committee D-11. In each specification the insulation must have a minimum tensile strength of 700 psi and elongation at rupture of 300 min. The performance compound (ES—34) must not show depreciation in tensile strength and elongation of more than 35 percent after 96 hours in the oxygen pressure test, while the heat resisting compound (ES—33) must not show more than 50 percent depreciation after 20 hours air pressure heat test or after 168 hours at 80 C in oxygen pressure test.

Soaps

By permitting the use of rosin to a maximum of 10 percent, the emergency provisions in the specifications for chip soap (EA—D 469) and for powdered soap (non-alkaline soap powder) (EA—D490) will increase the supply of fats for soap. This provision will not be resorted to, however, except in case the present shortage of fats grows more acute. With the permissible rosin, the titer of the mixed fatty acids prepared from soap can be reduced from 39 to 36 C.

Plastics

The latest in the series of important specifications and tests for plastics, developed through the intensive work of Committee D-20, covers so-called nonrigid type of plastics. The six tentative standards approved by Committee E-10 cover the following:

Nonrigid Polyvinyl Chloride-Acetate Plastics (D 742-43 T)
Nonrigid Ethyl Cellulose Plastics (D 743-43 T)
Nonrigid Polyvinyl Chloride Plastics (D 744-43 T)
Nonrigid Polyvinyl Butyral Plastics (D 745-43 T)
Tentative Method of Test for Stiffness in Flexure of Nonrigid Plastics (D 747-43 T)
Tentative Method of Test for Brittleness of Nonrigid Plastics (D 746-43 T)

In addition to these new tentative standards, several modifications in specifications were approved earlier this year. In the case of Polystyrene Molding Compounds (D 703) a new type 3 material has been added which is a general-purpose molding material characterized by superior heat-resistant qualities.

The new specification for polyvinyl chloride (D 742) covers two types of transparent and opaque material which have approximately a 95 percent vinyl chloride content. Type 1 is unfilled while type 2 contains an inert filler. There are five grades of material. Type 1 has tensile strength ranges from 1000 to 3000 psi and the three grades in type 2 have a tensile range of 600 to 1200 psi. Various properties are specified which can be determined according to ASTM tests that are cited, including the two new tests for stiffness and brittleness.

The two types of ethyl cellulose (D 743) are divided into three grades, filled, unfilled, and temperature resistant.

The three types of polyvinyl plastics provided for in D 744 are for general purpose, heat and oil resistance, and cold resistance. Nine grades of material are included.

The polyvinyl butyral plastics are of thermoplastic and curing types. The materials are based on polyvinyl butyral resin, obtained by the partial acetalization with butyral-dehyde of the product obtained by the complete or partial hydrolysis of polyvinyl acetate. Plasticizers, coloring agents, modifying agents, etc, can be incorporated as may be necessary to obtain the desired properties. There are seven grades of material, three thermoplastic and four of the curing type. Although the hardness serves as a general indication of grade in most cases, the hardness range of one grade suitable for a given application will overlap the hardness range of another grade. The low temperature classification,

as determined by the brittleness test (thiokol test) (D 736—43 T), also serves in classifying the various grades.

It was indicated in the new method for stiffness in flexure that the procedure is well suited for determining flexibility over a wide range. The apparatus is of the cantilever beam bending type of which the Olsen Stiffness Tester (Tour-Marshall and Olsen Design) is an example.

The test for brittleness of nonrigid plastics (D 746) establishes a temperature above which a normally nonrigid material is not brittle in its reaction to sudden deformation. The test uses an apparatus with a striking arm which moves at a designated rate. Beginning with the lowest temperature (—70 C or at least lower than the temperature at which nonfailure is thought to be) specimens are tested at 10 degree temperature intervals until a break is not obtained. Tests are repeated until five consecutive cases of nonbreaking are observed. Coolant used in the bath may be acetone, ethyl alcohol, butyl alcohol, etc. For very low temperatures liquid nitrogen is considered suitable.

Spectrographic Analysis

Two new tentative methods developed through the work of Committee E-2 on Spectrographic Analysis cover Tentative Spectrochemical Method for the Determination of Impurities in Tin Alloys (E 51—43 T) and Tentative Spectrochemical Method for the Determination of Impurities in Lead Alloys (E 49—43 T). These new methods will provide the analyst with rapid methods for investigating the various alloys of lead and tin, particularly those compositions covered by ASTM specifications.

The method involving lead alloys gives a procedure for the determination of 0.001 to 0.30 percent of antimony, arsenic, barium, bismuth, copper, iron, magnesium, nickel, silver, strontium, tin, and zinc in lead, lead-calcium, and lead-antimony alloys, with an average precision of ± 10 percent of the amount of the element sought. It is also applicable to other alloys of high lead content except those containing a large proportion of tin.

The average time per determination depends somewhat on how many elements are sought. Where six or more elements are sought, about 30 minutes should be allowed for the determination of each element in triplicate. This time includes that spent in preparation of the samples, arcing samples and standards, photographing spectra, processing and reading the plate.

The method for tin alloys (E 51) covers the determination of 0.001 to 1.0 percent of antimony, and 0.001 to 0.3 percent of aluminum, arsenic, bismuth, copper, iron, lead, nickel, and zinc in solders, bronzes, tin base die-cast alloys, and other alloys high in tin.

An additional procedure making use of photometric measurement has been included in the Tentative Method of Quantitative Spectrochemical Analysis of Zinc Alloy Die Castings for Minor Constituents and Impurities (E 27—40 T).

The revised Methods of Test for Quantitative Spectrochemical Analysis of Zinc for Lead, Iron, and Cadmium (E 26—35 T) may be applied to any grade of zinc providing the lead, iron, and cadmium contents are less than 0.1 percent. An arc spectrum is used, employing graphite electrodes, one of which is treated with a solution of the sample to be analyzed. Quantitative estimations are made by the comparison of the spectrum of the sample with the spectra of standard samples of known composition.

New Foreign Standards Now in ASA Library

THE following new and revised standards, just received by the American Standards Association, may be borrowed by ASA Members, or ordered through the ASA Library.

Canada

Concrete and Reinforced Concrete (2nd ed) Conservation of Reinforcing Steel (Emergency Revision Sheet) A23-1942

New Zealand

War Emergency Issues

Brass Rod for Cold Riveting (superseding NZSS PD11) NZSS E 117
Calcium Carbide NZSS E 115
Single Loop Bale Wires NZSS E 110
Vegetable Parchment for Butter Wrapping NZSS E 119
Zinc-Base Alloys for Die Castings NZSS E 116

Switzerland

(The following standards are available in both French and German)

Aluminum Pur 99,5 Caractéristiques mécaniques et physiques. Résistance à la corrosion. VSM 10845 E
Filieres Rondes. Forme fendue et forme pleine. Pour filetage Whitworth et filetage au pas du gaz. VSM 34650 a
Forme fendue et forme pleine. Pour filetage métrique. VSM 34652 a

Commercial Standard For Tire Retreading

Treading automobile and truck tires is the subject of a new Commercial Standard just issued by the National Bureau of Standards. The standard, which defines "retreading," "full recapping," and "top-capping," and includes general requirements, is intended to protect purchasers against inferior materials and workmanship, provide a basis for confidence in properly treaded tires, and conserve materials by insuring durability and safety. Requirements for inspection of the tire, for preparation of the tire, for the cement, and for the curing, equipment and temperature, are given.

Retreaded tires meeting these requirements may be labeled: "Guaranteed to conform with Commercial Standard CS108-43 as issued by the National Bureau of Standards, U. S. Department of Commerce."

The standard was prepared at the request of the National Institute of Treading Standards, an affiliate of the National Association of Tire Dealers, Inc. Associations and tire service companies which have indicated their acceptance of its requirements as their standard of practice in the production, distribution, and use of treaded tires are listed.

Commercial Standard CS108-43 is available from the Superintendent of Documents, Washington, D. C., at 10 cents.

Standards Issued by Associations and Government

(See "ASA Standards Activities", page 294 for new American Standards and progress on ASA projects)

Associations and Technical Societies

For the information of its Members, the American Standards Association gives here a list of the more important standards received during the past month by the ASA Library.

These standards may be consulted by Members at the ASA Library, or may be obtained from the issuing organization. The address of each organization is given for your convenience.

American Iron and Steel Institute (350 Fifth Avenue, New York, N. Y.)

Steel Products Manual, Hot-Rolled Carbon-Steel Bars Section 8 Revised June, 1943 25¢

American Society for Testing Materials (260 S. Broad Street, Philadelphia 2, Pa.)

Manual of Standards on Refractory Materials June, 1943 Paper cover $1.50; cloth $1.75

The Asphalt Institute (801 Second Avenue, New York 17, N. Y.)

Construction Specifications. Revised June, 1942. Published September, 1943.

Heating, Piping and Air Conditioning Contractors National Association (1250 Sixth Avenue, New York, N. Y.)

Net Square Feet Radiation Loads in 70 Deg F, Recommended for Low Pressure Heating Boilers Part 2 4th ed 1943

National Electrical Manufacturers Association (155 East 44th Street, New York, N. Y.)

Carbon, Graphite and Metal-Graphite Brush Standards No. 43-85 2nd ed July, 1943 25¢

Underwriters' Laboratories, Inc. (161 Sixth Avenue, New York, N. Y.)

Classification of the Hazards of Liquids No. 29 June, 1943

U. S. Government

(Wherever a price is indicated, the publication may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C. In other cases, copies may be obtained from the government agency concerned.)

National Bureau of Standards (Washington, D. C.)

Simplified Practice Recommendations

Before Industry for Approval

Packaging of Carriage, Machine and Lag Bolts Revision of R 60-30

Approved by Industry

Iron and Steel Pop Safety Valves R201-43

In Print

Carbonated Beverage Bottles R123-43 5¢
Cast Iron Radiators R174-43 5¢
Heavy Forged Hand Tools R17-43 10¢
Wire Rope R198-43 10¢

Federal Specifications Executive Committee (U. S. Treasury Department, Washington, D. C.)

Federal Specifications

(Copies available from Superintendent of Documents, Government Printing Office, Washington, D. C.)

The date after the title of the specification indicates when it becomes effective.

Aluminum-Alloy; forgings, heat-treated (amendment1) QQ-A-367b September 15, 1943
Aluminum-Base-Alloy; die-castings (amendment 2) QQ-A-591 September 15, 1943
Boards; drawing (amendment 1) GG-B-546 October 1, 1943
Brushes; hand-scrub (new) H-B-328 October 1, 1943
Duck; cotton, plied-yarns (army, numbered, and tent-duck) (superseding CCC-D-771a) CCC-D-771b September 15, 1943
Paint; oil, exterior, ready-mixed, light tints and whites (amendment 1) TT-P-40 September 15, 1943
Panelboards; equipped with fuse-connections, or switches and fuse connections (superseding E-W-P-146, 2/27/42) (amendment 1) W-P-146 October 1, 1943
Putty and Elastic Compound; for metal, sash glazing (amendment 1) TT-P-781a September 15, 1943
Putty; pure-linseed-oil for wood-sash-glazing (amendment 1) TT-P-791a September 15, 1943
Tallow (amendment 1) C-T-91 September 15, 1943
Twine; cotton, wrapping (amendment 2) T-T-871 October 1, 1943
Units, Heating, Electric; replacement (for water heaters, ranges, and hot plates) (new) W-U-546 September 15, 1943
Wrenches, Bolt and Nut; adjustable (new) GGG-W-631 October 1, 1943

Emergency Federal Specificaions

Bandages; gauze, roller, plain E-DDD-B-61a July 5, 1943
Cases; brief, leather (superseding E-KK-C-121, 4/21/42) E-KK-C-121a July 30, 1943
Hardware, Builders'; shelf and miscellaneous (superseding E-FF-H-111 and Appendixes I, II, III, IV dated 4/2/42) E-FF-H-111 July 1, 1943
Paper:
Computing-Machine (superseding E-UU-P-185, 8/14/42) E-UU-P-185 July 30, 1943
Kraft, Wrapping (superseding E-UU-P-268a, 5/26/42) E-UU-P-268a July 20, 1943
Mimeograph (superseding E-UU-P-388a, 8/19/42) E-UU-P-388a July 22, 1943

British Institution Reports Increased Use of Standards

DURING the past year 230 new and revised standards[1] or amendments have been issued by the British Standards Institution, the BSI annual report, just received by the American Standards Association, announces. These bring the total of British Standards now in use to about 1,500.

The use of British Standards has increased noticeably during the past year, the report shows, the sales increasing by 57 per cent. This, together with enlarged membership and a substantial increase in the appropriation provided by the British Government for the work of the British Standards Institution, shows the increasing recognition in Great Britain of the importance of industrial standards. These "are all gratifying indications of a steadily growing recognition by industry generally, and by the Government Departments concerned with industry, of the practical services which this Institution is rendering, and can increasingly render, to national efficiency both in times of war and in peace," Percy Good, director of the BSI, declared in his report at the annual meeting.

To help in getting all the British Standard specifications in a specific field into the hands of those concerned with their use, a new system has been adopted whereby a number of related specifications are published in one volume. The first example to be completed is the *Handbook of Workshop Practice*, bringing together 40 British Standard specifications at a moderate price.

As a means of bringing about their use in other countries, the British Standards Institution maintains complete sets of British Standards at British diplomatic and trade commissioner offices as well as in the libraries of other national standardization organizations. The American Standards Association has a complete file of these standards for reference in the ASA library, and maintains as complete a sale file as possible in view of the difficulties of transportation.

Prepare Spanish and Turkish Handbooks

Information about British Standards is also being disseminated in other countries through the publication of a *Spanish Handbook of British Industrial Practice* and through publication in Turkish of three engineering handbooks based on British practice. These Turkish handbooks, which were suggested by the British Council, are now being prepared.

The most important projects carried forward by the Institution during the past year, the report shows, are its work on packaging, on codes of practice for the building industry, and on Factory Office Systems.

The rationalization (simplification) of tins and cans which was undertaken by the Institution with the approval of the Ministry of Supply, has resulted in British Standard Schedules of Sizes and Types for all forms of packages. The Anglo-American Packaging Committee, which is a joint committee of the Ministry of Production and the Harriman Mission of the United States, has now decided on the compilation of a British packaging manual similar to the American manual which contains agreed specifications for the Services and Lend-Lease. The British Standards Institution has been asked to undertake the work of preparing this manual.

A first report has been issued on the Codes of Practice for building.[2] This report defined the objectives of the work, and outlined a comprehensive scheme designed to insure that the various codes shall be coordinated with each other and shall cover every operation involved in building work. The various committees to prepare the codes have now been set up and are starting work. When completed the codes will be entitled "British Standard Codes of Practice" and will be issued by the Institution in the ordinary way.

Issue Principles of Production Control

A program on Factory Office Systems was started during the past year, and the first bulletin on the Principles of Production Control was issued in April. Other reports on the Application of the Principles, on Cost, on Stock Control and Storekeeping, Pay Roll Methods, and Office Practice and Organization are in an advanced state of preparation. Another report which is being considered will probably deal with Drawing Office Organization. These proposed reports all deal principally with engineering, but one booklet is planned which will be of a more general nature and will deal with industrial purchasing. It is planned to form a small committee of local experts in each region to advise any firms asking for help in applying the recommendations of these reports to their special problems. These local committees will be organized with the cooperation of the Regional Controllers of the Ministry of Production.

"Surveying all that has happened during now nearly four years of a war which has made demands almost, if not wholly, unparalleled upon the productive powers and resourcefulness of the nation, we can pay tribute to the foresight of our founders and to the wisdom which has guided the course of this Institution," Mr. Good declared in his report to the BSI Annual Meeting. "Its constitution, developed gradually and cautiously, has given it a flexibility and adaptability which we may, I believe, justly claim has enabled it to make a powerful contribution to national efficiency—a contribution all the more effective because in the main it has been devoid of any element of compulsion, but has been based on the principle of consent and voluntary cooperation, with Government encouragement and assistance but without Government control. I believe it is by adhering to that course that the Institution can continue most effectively to contribute to the tasks which will confront the nation when the war comes to an end—that is, to the rebuilding of our industries and the economic well-being of our whole community."

[1] New and revised standards received by ASA are listed in INDUSTRIAL STANDARDIZATION as they are received.

[2] For a description of this program in its early stages, see INDUSTRIAL STANDARDIZATION, October, 1942, pp. 243-246.

Carl Edvard Johansson

Grand Master of Industrial Measurement

1864-1943

FROM Sweden the news has reached us that Carl Edvard Johansson, inventor and manufacturer of the famous gageblocks, has passed away at the age of 79 years. During his long and active life, he made invaluable contributions to the art of industrial measurement of length, not only by producing gageblocks of such unbelievable accuracy that even today technical men marvel at them, but also by making some fundamental decisions which later became world standards.

In 1894, the Swedish Government started the manufacture of an army rifle in the Royal Arsenal of Eskilstuna. Johansson, being in charge of dimensional control in that factory, conceived the idea of producing steel gageblocks that could be combined into sets representing all lengths within a given range, stepping up by as little as one micron, or 0.00004 inch. The solution of this problem required: (1) the manufacture of gageblocks with end surfaces that, for practical purposes, were perfectly smooth and parallel; (2) control of the length of each block within limits so close that the combined length of a set of blocks would lie within the limits specified for the dimension represented by the set; and (3) treatment of the steel to prevent molecular changes that might spoil the accuracy of the block. We know in how brilliant a manner Johansson solved this problem. For many years, industry has had at its disposal gageblocks held within a tolerance as small as 2 millionths of an inch per inch of length—which is comparable to a tolerance of 1/8 inch on a distance of a mile.

The first blocks were made in 1896. In the early period of his work, Johansson realized that the temperature at which gageblocks are expected to have a given size should be defined. For a change in temperature of one degree Fahrenheit, a block expands or contracts about 6 millionths of an inch, for each inch of its length. The "reference temperature" of 20 C or 68 F was adopted by Johansson as one that could be conveniently maintained in the shop during all seasons. It was approved also, for industrial measurements, by the International Bureau of Weights and Measures and the International Standards Association (ISA). For the sake of international uniformity, the British and the French gave up their original standards, 62 F and zero C (32 F), respectively.

When in 1912 Johansson started to make gageblocks for the American market, he adopted the inch-millimeter conversion ratio 25.4. The ratio corresponding to the legal definition of the inch in the U. S. is about 25.400051. The difference between the two ratios, or about 2 parts in one million, was used by Johansson as the plus tolerance on his most accurate blocks. On behalf of the Ford Motor Company, with which he had become associated in 1923, Johansson asked the ASA in 1932 that the ratio 25.4 be made an American Standard. Following a general conference and a canvass of

industry, this standard was approved by the ASA in 1933.[1] The ratio 25.4 has also been approved by the British Standards Institution. Like the reference temperature (68 F), it has become a world-wide industrial standard. It is impossible to estimate how much the two decisions, made by Johansson several decades ago, have meant in the advancement of the manufacture of interchangeable parts.

Most fascinating, however, was the development of Johansson's gageblocks, sometimes called the "mysterious gages" because when merely "wrung" together, they will remain assembled as a set. The name Johansson became the symbol for the highest degree of accuracy attained in the mechanical industry and blocks marked "C.E.J." are now found everywhere—on the bench of the toolmaker or machine-tool operator, as well as in the inspection department. As a "supreme court" of accuracy, they will serve to arbitrate differences of opinion concerning results of gaging inspection that may arise between the workshop and the inspection department.

For his outstanding achievements, Carl Edvard Johansson has received many honors. The technical world will rank him among the great engineers and those who had the privilege of knowing him will keep a lasting memory of his genuine simplicity, gentle wit, and charming personality.

—JOHN GAILLARD

[1] Inch-Millimeter Conversion for Industrial Use (B48.1-1933).

ASA Standards Activities

American Standards

Standards Available Since Our September Issue

Building Code Requirements for Structural Steel American Standard A57.1-1943 40¢
Safety Code for Use, Care, and Protection of Abrasive Wheels American Standard B7-1943 35¢
Testing Laminated Round Rods Used in Electrical Insulation American Standard C59.15-1943 25¢
Testing Laminated Tubes Used in Electrical Insulation American Standard C59.14-1943 25¢

Standards Approved Since Our September Issue

Allowable Concentration of Lead and Certain of its Inorganic Compounds American Standard Z37.11-1943
Circular and Dovetailed Forming Tool Blanks American Standard B5.7-1943
Ferrous Plugs, Bushings, Locknuts, and Caps with Pipe Threads American Standard B16.14-1943
Machine Tapers, Self-Holding Taper Series American Standard B5.7-1936 Revision of B5.10-1943
Shafting and Stock Keys American Standard B17.1-1943 Revision of B17.1-1934
Pre-Timed, Fixed Cycle Traffic Signal Controllers American Standard D11.1-1943

Standards Being Considered By ASA for Approval

Allowable Concentration of Toluene Z37
Basic Sulfate White Lead, Tentative Specifications for (ASTM D82-42T) Revision of American Standard K7-1941
Chemical Analysis of Alloys of Lead, Tin, Antimony and Copper (ASTM B18-36T) Revision of K5-1922
Chrome Yellow and Chrome Orange, Tentative Specifications for (ASTM D211-42T) Revision of American Standard K27-1941
Copper-Base Alloy Forging Rods, Bars, and Shapes, Tentative Specifications for (ASTM B124-42T) Revision of American Tentative Standard H7-1939

Standards Being Considered—(Continued)

Letter Symbols for Gear Engineering B6.5
Spindle Noses and Arbors for Milling Machines B5.18
Tool Shanks and Tool Posts for Lathes, Planes, Shapers, Boring Mills, and Turret Lathes B5.2 Revision of American Standard, Tool Holder Shanks and Tool Post Openings B5b-1929

Standards Submitted for Consideration Since Our September Issue

Basic Carbonate White Lead (ASTM D81-41) Revision of American Standard K23-1941
Carbon-Silicon Steel Plates of Ordinary Tensile Ranges for Fusion-Welded Boilers and Other Pressure Vessels (ASTM A201-39) Revision of American Standard G31.1-1942
Electrolytic Copper Wire Bars, Cakes, Slabs, Billets, Ingots, and Ingot Bars (ASTM B5-42) Revision of American Standard H17.2-1942
Low Tensile Strength Carbon-Steel Plates of Structural Quality for Welding (ASTM A78-40) Revision of American Standard G40.1-1942
Petroleum Products Z11
- Test for Carbonizable Substances in Paraffin Wax (ASTM D612-43)
- Test for Carbonizable Substances in White Mineral Oil (Liquid Petrolatum (ASTM D565-43)
- Test for Dropping Point of Lubricating Grease (ASTM D566-42)
- Test for Vapor Pressure of Petroleum Products (Reid Method) (ASTM D323-42) Revision of American Standard Z11.44-1942
- Viscosity-Temperature Charts for Liquid Petroleum Products (ASTM D341-39) Revision of American Standard Z11.39-1939

Sampling and Analysis of Coal and Coke (ASTM D271-42) Revision of American Standard K18-1942

American War Standards

Standards Approved and Available Since Our September Issue

Fixed Composition Resistors C75.7-1943 60¢
Protective Occupational Footwear Z41-1943
- Men's Safety-Toe Shoes Z41.1-1943 (2nd edition)
- Men's Conductive Shoes Z41.3-1943
- Men's Explosives-Operations (Non-sparking) Shoes Z41.4-1943 (2nd edition)
- Men's Electrical-Hazards Shoes Z41.5-1943 (3rd edition)
- Men's Foundry (Molders) Shoes Z41.6-1943 (3rd edition)
- Series of 5 Standards 40¢
- Women's Safety-Toe (Oxford) Shoes Z41.2-1943 (3rd edition)
- Women's Safety-Toe (High) Shoes Z41.7-1943 (2nd edition)
- Women's Explosives-Operations (Non-sparking) Shoes Z41.8-1943 (2nd edition)
- Women's Conductive Shoes Z41.9-1943 (2nd edition)
- Series of 4 Standards 40¢

Steatite Radio Insulators C75.2-1943 50¢

Standards Under Way

Color Code for Lubricants for Machinery Z47
Components for Military Radio C75
- Capacitors
  - Fixed Ceramic-Dielectric Capacitors C75/381*
  - Fixed Molded Paper-Dielectric Capacitors C75/221*
  - Paper-Dielectric Capacitors

War Standards Under Way—(Continued)
Components for Military Radio—(Continued)
- Crystals
  - Crystals and Holders—Aircraft Radio Type
- Dynamotors
- Insulating Materials
  - Glass Radio Insulators C75/275*
  - Plastics
  - Laminated Thermosetting Plastic Materials (Sheet and Plate)
  - Molded Thermosetting Plastic Materials
  - Thermoplastic Materials (Rigid)
  - Porcelain Radio Insulators
- Resistors
  - Composition Potentiometers and Rheostats
  - Fixed Wire-Wound Resistors (Power Type)
  - Accurate Fixed Wire Wound Resistors (1 percent Maximum Tolerance)
  - High-Power Variable Wire-Wound Resistors
  - Low-Power Variable Wire-Wound Resistors
- Toggle Switches
- Vibrators

Cylindrical Fits B4
Goggles and Respiratory Equipment, Standardization and Simplification of Z2

* Printed draft is available.

War Standards Under Way—(Continued)

Machine Tool Electrical Standards Revision of C74-1942
Packages for Electronic Tubes Z45
Protective Occupational (Safety) Clothing Z51
Replacement Parts for Civilian Radio C16
Volume Controls (Home Receiver Replacement Type)
Resistance Welding Equipment
Safety in Electric and Gas Welding and Cutting Operations
Screw Threads B1
Acme Screw Threads for Aircraft
Truncated Whitworth Screw Threads
Sizes of Children's Garments and Patterns L11
Welding Arc Hand Shield and Helmets Z2
Women's Industrial Clothing L17

New Project Authorized

Photography and Cinematography, Materials and Equipment

News About ASA Projects

Circular and Dovetailed Forming Tool Blanks (B5.7-1943)—

This American Standard was approved by the ASA on October 7, 1943. It is a revision of the first edition of 1936. In addition to the data on the tools, the new standard contains data on the toolholders.

Clothing, Women's Industrial (L17)—

The ASA War Project on women's industrial and safety clothing has been divided into two projects, one on industrial clothing, and the second on safety clothing. The second project will also include safety clothing for men. The project on industrial clothing will cover specifications for the minimum number of types, patterns, styles, and sizes necessary to provide for the functional requirements of industrial operations. It will also provide detailed construction requirements for such clothing, including size standards, and specifications for materials in order to make the uptimum use of materials, equipment, and other resources.

Clothing, Protective Occupational (Safety) (Z51)—

This new War Project has been organized at the request of the War Production Board to cover specifications for types, patterns, styles, and sizes for safety clothing for both men and women. A subcommittee of the L17 committee has been actively at work for four months and drafts of three proposed standards have already been circulated. The personnel of this subcommittee is being extended to become a separate War Standards Committee (Z51) with a well-rounded membership.

Inspection and Tolerances for Gears—

A draft of a proposed American Standard, Inspection and Tolerances for Gears, was recently distributed among a number of organizations and individuals for criticism and comment. The draft was developed by Subcommittee 9 on Inspection of ASA Committee B6 on Gears. Granger Davenport of Good and Eberhardt, Inc., is chairman of this subcommittee. The draft contains four sections dealing with spur and helical gears; worms and worm gears; bevel and hypoid gears; and backlash in gears. Comments received will be referred to the subcommittee for its consideration.

Machine Tapers, Self-Holding and Steep Taper Series (B5.10-1943)—

This American Standard was approved by the ASA on October 1, 1943. It is a revision of the American Standard for self-holding tapers approved in 1937, which has been supplemented by a series of six preferred, and six intermediate steep tapers (3.5 in. per foot).

Shafting and Stock Keys (B17.1-1943)—

A revision of the American Standard of 1934 was approved by the ASA on October 7, 1943. It is concerned solely with a change from 0.005 to 0.006 in. in the tolerance on round shafting in diameters of 6¼ to 8 in., inclusive. This change will be made in copies on hand. Also, the symbol will be changed to B17.1-1943.

Warren Emley Retires

Was on Staff of National Bureau of Standards for Thirty Years

Warren E. Emley, chief of the Organic and Fibrous Materials Division of the National Bureau of Standards, retired October 1 after more than 30 years' service.

Mr. Emley's Government career commenced in 1909 when he joined the staff of the U. S. Geological Survey as a junior chemist. This work was transferred in 1910 to the National Bureau of Standards. He became chief of the section on lime, gypsum, and sand lime brick, and in 1924 was made assistant chief of the Division of Non-Metallic Minerals. In 1926 he was appointed chief of the newly organized Division of Organic and Fibrous Materials, which is now engaged in research work on rubber, textiles, paper, leather, and plastics.

Mr. Emley has been active in standards work as a member of the American Society for Testing Materials and as a member of the committees on sheets, blankets, and shoes of the American Standards Association. As one of a committee of three he helped to set up standard grades of wool at Bradford, England, in 1925. He is an honorary member of the National Association of Dyers and Cleaners, and member of the American Chemical Society, the Washington Academy of Sciences, the American Institute of Chemical Engineers, and chairman of the committee on miscellaneous materials, National Advisory Committee for Aeronautics. He is a member of the committee on research of the Textile Foundation, and a member of the council and chairman of the committee on physical testing methods of the American Leather Chemists Association; and chairman of the Federal Interdepartmental Committee on Leather.

Bureau Broadcasts Frequencies From New Radio Station

The National Bureau of Standards is now broadcasting standard frequencies from the Bureau's new radio station, WWV, at Beltsville, Md. The service has been extended so that it now includes: (1) standard radio frequencies; (2) standard time intervals accurately synchronized with basic time signals; (3) standard audio frequencies; (4) American Standard musical pitch, 440 cycles per second, corresponding to A above middle C.

New uses for grinders, higher speeds, new types of wheels have led to revision of the

Safety Code for the Use, Care, and Protection of Abrasive Wheels (B7-1943)

Price Corrected **35¢** per copy

The entire code has been carefully reviewed. New rules and tables are drawn from the collective experience of the grinding wheel manufacturers and the users.

The standard covers: General rules for operation; Basic speed tables for all types of wheels in use; Proper control for higher speeds; Relationship between testing speed and operating speed; Protection hoods for portable grinders. Grinding operations for which entirely new rules have been written include: Crankshaft grinding; Camshaft grinding; Thread grinding.

Developed under the leadership of:

The Grinding Wheel Manufacturers Association
International Association of Industrial Accident Boards & Commissions

Order from:

American Standards Association

29 West 39th Street, New York 18, N. Y.